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THE CANADIAN

ENTOMOLOGIST.

VOLUME IV.

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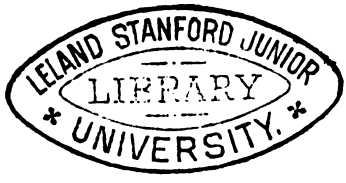

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The Canadian Entomologist.

VOL. IV. LONDON, ONT., JANUARY, 1872. No. 1

TO ALL WHOM IT MAY CONCERN—GREETING!

A Happy New Year to you, kindly reader; may the days of this year roll joyously along for you wherever you may be, whether your lot is cast in our peaceful Canadian land, or in the sea-girt isles of the old home, whether in the midst of the matured Republic of our cousins across the lakes, or in the latest democracy of *la belle France*, whether on the shores of the stormy Atlantic, or on the borders of the broad Pacific, whatever your nationality, whatever your position in life, we look upon you as one of our brotherhood of Entomologists, and we include you amongst our friends.

For the fourth time we are commencing a new volume, and we do so with feelings of more than ordinary satisfaction, inasmuch as we have at length fulfilled all our promises by the punctual completion of the preceding volume within the appointed year. The third volume we commenced with the issue of its first number in April last, and the second in June; when we began the preparation of the third in the following month, our task seemed hopeless as regarded the performance of it before the close of the year. However, by the regular issue of double numbers, we were enabled to complete the volume of two hundred and forty pages, with its forty illustrations, by the end of 1871, and now we start fair with the new year, and hope to be regular and punctual throughout it. While we thus congratulate ourselves upon our satisfactory position, we must by no means omit to mention—it would be ungrateful in us indeed to do so—how much we are indebted to others, and how highly we esteem the kind assistance that has been so freely afforded us. Especially we would offer our thanks to those friends outside of our own country whose contributions have added so much to the value of our pages. May we beg that they will lay us under still further obligations by the continuance of their favours during the coming year, and that others also will not hesitate to follow their example?

While we thank our many friends for their kind assistance and encouragement, we regret that we have to mete out a word of censure for others

whose forgetfulness—we do not for a moment think it is anything more—threatens to cause us some little embarassment. We allude to those who have been for some time receiving this publication, but who have neglected to return the *quid pro quo*, and to send us the trifling amount of their subscription. It is true that we are aided by a grant from the Legislature of the Province, but that aid alone is not sufficient to meet all our requirements and necessary expenses, nor indeed is that aid intended by any means to relieve our subscribers from the obligation they have incurred by receiving our publication. We feel that during the past year we have furnished a volume of our journal that is fully worth the dollar charged to all who take even the slightest interest in Entomology, and that we may with justice call upon all in arrears to send in at once the amount of their indebtedness, as well as their subscription for the forthcoming volume. By a resolution of the Council, a copy of this number is sent to all whose names are on our subscription list, but no further numbers will be sent to any one whose dues are not paid before the issue of the second number on the 15th of February next. We regret exceedingly to be obliged to make this statement, but we trust that the allusion to these matters now, will so effectually remind our readers of their duty towards us that we shall never require to refer to the subject again. The CANADIAN ENTOMOLOGIST will (D.V.) be issued regularly on the 15th of each month, and will consist of twenty pages as heretofore.

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DESCRIPTION OF THE WHEAT WIRE-WORM.

Agriotes mancus Say.

BY J. PETTIT, GRIMSBY, ONTARIO.

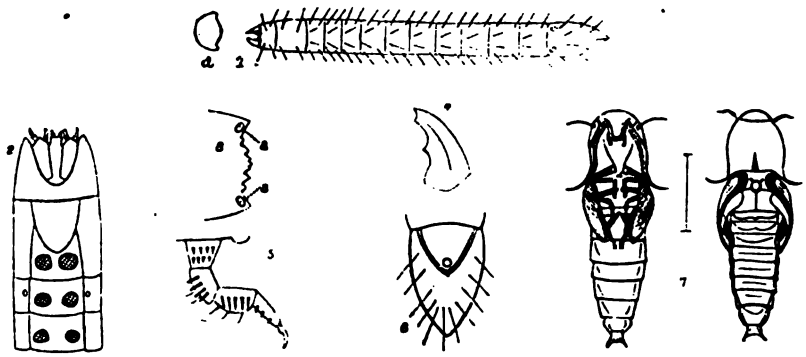
For many years an insect, familiarly known among farmers as "the wire-worm," has committed ravages from time to time among the wheat crops in different parts of the Province. As the history of this insect has not hitherto been traced out, I am happy to be able to make public, through the pages of the CANADIAN ENTOMOLOGIST, the following description of its larval and pupal states.

In the fall of the year 1870, so unusual an amount of damage was inflicted upon the wheat crops in this vicinity by this wire-worm that I was led to try and breed it to the perfect state, with a view to ascertaining what species it was the larva of. By digging about the roots of the wheat plants, I obtained about a dozen specimens, which were placed with a few wheat plants in a large flower-pot, where they were kept supplied with food by planting occasionally a small quantity of wheat. With the first cold weather they ceased to eat, and were then placed in a sheltered situation until the return of warm weather in spring, when they were restored to the breeding cage. They soon gave evidence of being alive, and possessing unimpaired appetites; their rapid consumption of the wheat plants rendered it necessary to renew the supply quite as often as before. They were fed in this way until the month of July, when my absence from home caused them to be neglected; on my return there was not a vestige of food left. Thinking that the worms had probably died of starvation, I paid no further attention to them until the 26th of August, when on removing a part of the earth from the pot, a pupa was disclosed, and on the 3rd of September the first imago appeared, which proved to be a specimen of *Agriotes mancus* Say. As only two more specimens came out during the remainder of September, I turned the earth out of the pot and carefully examined it; the inspection revealed seven specimens of the imago in the little cells in which they had transformed, and one larva.

Among the larvæ collected, I had noticed one less than half the size of the others, and evidently much younger, which would account for the one still in the larval state. It had attained, however, a size fully equal to that of the others when first brought in during the previous autumn; and hence I have formed the opinion that the larval state does not last longer than three years. This opinion has since been strengthened by the obser-

vation of a large number of larvæ, which appeared readily separable into *two sizes*, corresponding to those originally collected for breeding. Westwood, in his "Modern Classification of Insects," (vol. 1, 238), states respecting the larva of an allied species *(A. obscurus)* which, in Europe, feeds upon the roots of wheat, rye, oats, barley and grass, that according to Bjerkander, a Swedish Naturalist, "it is *five* years in arriving at the perfect state." Curtis, in his "Farm Insects," (page 161) makes a similar statement upon the same authority, and adds that those which he had himself feeding for ten or twelve months scarcely increased in size during the time. As already stated, however, I am of opinion that our species is by no means so long lived, but that it attains maturity in three years—a period quite long enough, the agriculturist must think, in which to inflict damage upon the crops.

Through the kindness of Dr. Horn, of Philadelphia, I am enabled to offer to the readers of the CANADIAN ENTOMOLOGIST the following careful description of the larva and pupa which, together with the accompanying illustrations, he has prepared from examples that I furnished him. I need only add that I have now another batch of larvæ in breeding, and that I hope next season to be able to afford some further information on points of interest connected with the life history of this destructive insect. The imago is described in Say's Entomological books, vol. ii., p. 111.



1. Larva much magnified. (natural size | ——— |) 1 *a*. Transverse section. 2. Underside of head and first three or thoracic segments, showing the parts of mouth and the position of first spiracle. 3. Margin of front; *a*. Position of antennæ. 4. Mandible. 5. Leg. 6. Terminal segment beneath. 7. Pupa, upper and under view. The line between represents the natural size.

LARVA (Fig. 1.) *Form.*—Elongate subcylindrical, dorsal surface more convex.

Tegument.—Partially corneous, colour testaceous.

Surface.—Smooth shining, with very few wrinkles and a few short erect hairs arranged as follows : two on each side of the middle of dorsum, two near the anterior and two near the posterior margin of each segment, laterally ; beneath, one near the anterior and posterior margins on each side ; last segment with more numerous setæ.

Cephalic segment one fourth broader than long, sides straight slightly convergent anteriorly, feebly convex and slightly impressed on each side near the anterior margin. Mouth directed anteriorly. Ocelli none (fig. 2).

Antennæ short, three jointed, conical, last joint more slender than the preceding ; placed at side of head behind the mandibles (fig. 3*a*).

Superior cephalic plate prominent at middle, middle lobe itself trilobed; its lateral lobes acute, middle lobe tridentate.

Mandibles robust corneous, moderately arcuate bifid at tip and with a short acute tooth at middle of inner edge (fig. 4).

Mentum elongate, slightly broader in front, less corneous in front ; palpigerous pieces connate, together subquadrate ; palpi short two jointed, basal joint as wide as long, last joint longer conical.

Maxillæ composed of an elongate basilar piece on each side of mentum ; palpi four jointed ; outer lobe two jointed, terminal joint obtusely pointed at tip ; inner lobe feebly developed, concealed behind the outer lobe and ciliate on its inner margin.

Prothoracic segment subquadrate.

Meso and *Metathoracic* segments shorter than the preceding, and together scarcely longer.

Abdomen, of nine segments, gradually increasing in length, 1st slightly longer than metathorax, last segment nearly as long as the two preceding, elongate oval and obtusely pointed at tip. Segments beneath as above, last segment subtriangular, base straight, sides rounded.

Prosternum truncate in front, oval gradually narrowing behind, leaving a triangular membranous space between it and the inflexed portion of the sides in front of the coxæ.

Coxæ. Anterior narrowly separated, middle more and hinder still more separated.

Legs short. Coxæ conical with a double row of short corneous spines in front. Femur and tibia short, armed beneath with two rows of spinules

and each with one or two long setæ. Tarsal piece cylindrical, longer than tibia, with double row of spinules beneath, and a long moderately arcuate claw (fig. 5).

Spiracles. Nine pairs. First pair on the inflexed portion of the meso-thoracic segment slightly in front of the coxæ. The remaining spiracles are placed on the sides of the abdominal segments nearer the anterior margin.

The last abdominal segment (fig. 6, underside) has near its basal margin on each side a deep pit of oval form. These are certainly not spiracles, being very much larger and of different construction. Their appearance leads me to suspect them of being glandular fossæ, but of what use or why so large comparatively, I am unable to decide.

PUPA (fig. 7). The pupa resembles the imago in many of its characters, being however about one fourth longer and in the abdominal region more slender. The only differences of moment being the following :—

Thorax at each angle with a stout bristle-like appendage more slender towards the tip, about a sixteenth of an inch long. That at the anterior angle is supported on a small papilla, the posterior being prolonged from the tip of the angle. Terminal abdominal segment above subquadrate, emarginate at tip, angles acute and divergent, beneath with a deep sinuous groove on each side and a median shallower groove.

Abdomen above and beneath of nine segments, the first very narrow distinctly visible above, beneath visible only at the sides ; second slightly broader, beneath nearly entirely concealed. The remaining segments are distinctly visible both above and beneath, the distal angles being slightly prominent, giving the sides of the abdomen a dentate appearance.

In assuming the perfect state, the abdomen loses apparently two segments above and four beneath. These are accounted for in the following way : The first two *ventral* segments are obliterated, the terminal contains the genital apparatus which, with the preceding segment, is retracted and becomes concealed. The penultimate segment is thus the sixth of the imago which is frequently visible by dissection. The first two dorsal segments of the pupa remain in the imago, while the last two are lost as indicated above.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Vol. III., page 224.

GRACILLARIA.

The species of this genus bear some resemblance—especially the smaller species—to *Lithocolletis;* but they may be distinguished by the attitude in repose in most species, and by the developed maxillary palpi in all. They usually sit (especially the larger species, for I have not observed it in some of the smaller ones), with the anterior part of the body elevated upon the anterior and middle legs, whilst the posterior legs are applied to the sides of the abdomen, the apex of which touches the surface upon which they rest. In some of the smaller species, the maxillary palpi are small, and sometimes almost concealed by the labial palpi. This is the case in *Gracillaria robiniella (Parectopa robiniella* Clemens), and *G. lespedezæfoliella (P. lespedezæfoliella* Clem.), upon which Dr. Clemens erected the genus *Parectopa*, as not having any visible maxillary palpi. I have found the maxillary palpi distinct, though small, in *G. robiniella. G. lespedezæfoliella* I have not seen; but from Dr. Clemens' description, it is very closely allied to *G. robiniella*, and no doubt has the same structure.

But the genus is by no means a homogeneous nor a distinctly limited one. The species differ in many respects as to structure, as well as style or pattern of ornamentation, and habits of larvæ and pupæ.

The genus *Coriscium* was erected to include certain species having the second joint of the labial palpi tufted. But, as Mr. Stainton has well remarked, there is considerable variation among the species in this respect, and the genus seems to pass almost insensibly into *Gracillaria.* The only material point of difference between *Gracillaria* and *Parectopa* was the supposed absence of maxillary palpi in the latter genus, and that was a mistake.

Herrich-Schaffer divides the genus, constructing a new genus, *Euspilapteryx*, for the smaller species, (and in which no doubt he would have included the *Parectopa* of Dr. Clemens), but which does not seem to me to be at all a natural division. And lastly, Zeller divides the genus into two sections, in one of which the discal cell gives off nine veins to the margin, whilst in the other it gives off only eight veins. This appears to

me to be the best division which has been attempted; but the number of species is not yet large enough to make its division necessary as a matter of convenience, and therefore it appears to me best to let it stand until the study of a large number of species in all stages of growth shall make a natural division possible.

The species differ in the *size* of the labial palpi as well as in their *clothing*. In some, the vertex is very slightly roughened, shewing an approach to *Ornix*; and in some, the scales at the sides of the vertex project over the base of the antennæ, almost forming small tufts.

There is also considerable difference in the larval habits of the different species. Some, *perhaps*, do not mine leaves at any period of their lives, or for a very short period, if at all. Others mine them only for a short period. When leaving the mine, they become external feeders, rolling the leaves of their food plants into various forms. Others again are miners during their whole larval existence, and of these, some never leave their first mine until they do so to become pupæ, whilst others frequently leave their old mine to construct a new one. Some pupate under a dense but semi-transparent silken coverlet or web, whilst others make a small silken cocoon or *nidus*, and one species known to me pupates in the mine.

In such a genus, it is worse than useless to encumber science with a multitude of generic names until a sufficient study of many species has made a natural division practicable, or at least until the accumulation of species makes an artificial division necessary.

1. Gracillaria robiniella.

Parectopa robiniella Clemens. *Proc. Ent. Soc., Phila., 1863, p. 4.*

Dr. Clemens erects this genus for his *P. lespedezæfoliella*, in the *Proc. Acad. Nat. Sci., Phila., 1860, p. 209*, and afterwards describes this species as above stated. *Gracillaria (Proc. Ent. Soc., Phila., 1863, page 9)*, as limited by him, is Zeller's section A, in which nine veins are given off from the discal cell. This insect belongs to the division in which there are only eight, and its neuration only differs from that of *G. salicifoliella, n. sp.*, in having one of the veins, from the apex of the cell, furcate *near its origin*, whilst *G. salicifoliella* has it furcate *at its origin*, and slightly bent. Nor is the head any more tufted than in *Salicifoliella*, and some other *Gracillaria* which have long loose scales on the vertex. As before stated, Dr. Clemens was mistaken in the statement that the maxillary palpi are not visible, and it is therefore as clearly a *Gracillaria* as any of the other small species

belonging to Zeller's section with eight veinlets. It mines the leaves of the Locust (*Robinia pseudacacia* and *R. hispida*), and of various species of *Desmodium*. (Dr. Clemens was acquainted with the larva mining *Desmodium*, but supposed it to be the larva of his *P. lespedezæfoliella*. I have, however, bred *robiniella* from it). Like many other larvæ of *Gracillaria*, it frequently leaves an old mine to construct a new one. The mine is pale yellowish, is usually on the midrib, with lateral branches running out from it. I am not acquainted with any *Gracillaria* which makes a similar mine, but scarcely any two species make mines alike. When the larva is disturbed, it conceals itself on the midrib. *Gracillaria pavoniella*, according to Stainton, (*Nat. His. Tin., vol. 8, p. 186*), has the same habit. It pupates in a small *nidus* on some object on the ground.

The imago is dark golden-brown, almost black, with *three oblique silvery costal* streaks, and the *same number of dorsal ones opposite* the spaces between the costal ones; and a *transverse* narrow silvery line beginning on the costa, within the ciliæ, near the tip. Head white.

P. lespedezæfoliella, which must also be a *Gracillaria*, seems, from Dr. Clemens' description, to differ from this species mainly in having only *two costal streaks*, and in having all of the streaks situated a little differently. *Alar ex.* less than 3/5 inch. *G. robiniella* occurs at Green Bay, Wisconsin. Pennsylvania. Kentucky. New Orleans.

Dr. Clemens says that he always found the mines untenanted when the leaves were mined by *Lithocolletis robiniella*. Such has not been the result of my observations. On the contrary, I have found the larvæ in the mines of both species, and also those of *L. ornatella* in their mines, at all times from the middle of July until November, many of all these species being still in the larval state when the leaves fall. And nothing is more common than to find two, and, very frequently, three of these different species mining the same leaflet at the same time; and, late in the season, *Depressaria pseudacaciella*, and an unknown larva, may be found as intruders in the same mines. And as heretofore stated, I find, during the latter part of summer and in the fall, this species and the two species of *Lithocolletis* in all their stages—larva, pupa, and imago—at the same time.

Gracillaria eupatoriella. N. sp.

This species mines the leaves of *Eupatorium ageratoides* on the under side, the lower cuticle becoming wrinkled. The larvæ were found in the mines in July. They frequently leave old mines and make new ones.

The larva is greenish, with dark green contents, but just before becoming a pupa, it changes color, becoming bright crimson. It pupates in a small *nidus* on the ground.

I am able to describe the imago only from a specimen which emerged from the *nidus*, but was unable to rupture the pupal envelope, which I removed after its death. In this specimen, the head and thorax appeared to be white with a blackish spot on the labial palpi, and a wide longitudinal blackish streak on the thorax. The wings are shining dark brown or black, with purplish reflections, with a dorsal basal white streak ending in a white spot nearly opposite, but a little behind which, is a small costal white streak, behind which again is a long oblique costal white streak reaching almost to the dorsal margin. There is another costal white streak just before the ciliæ. *Alar ex.* a little more than ¼ inch. The colours and their arrangement do not differ very greatly, therefore, from Dr. Clemens' two species of *Parectopa* above mentioned. Kentucky.

Gracillaria plantaginisella. N. sp.

In this species the labial palpi, which are very long, have the second joint not tufted, but clothed below with long loose scales. They are white, with a golden brown stripe beginning on the apex of the second joint beneath, and extending along the under side of the third to the apex. Maxillary palpi white, tipped with brownish. Antennæ pale brownish, iridiscent; face opalescent; vertex brownish golden with a silvery white stripe on each side extending back over the sides of the thorax, which is brownish golden. Anterior wings brownish golden or deep red orange, according to the light, with a longitudinal median white streak near the base, but not touching it, in some specimens; in others reaching the base, and seeming to be a continuation of the white lateral thoracic streaks. Four costal and three dorsal silvery white (in some lights bright metallic) streaks, each of which is dark margined on both sides and around the apex, and the dark margins slightly powdered posteriorly on the disc, those of the third and fourth costal, and second and third dorsal, being confluent with each other and with the brownish portion of the apical part of the wing. The first costal is at about the basal fourth, is the largest, is a little oblique, and produced along the costa towards, but not to, the base. The first dorsal opposite the space between the first and second costal; the second and third dorsal nearly opposite the third and fourth costal respectively; the second and third costal a little oblique backwards; the fourth costal and

the third dorsal a little oblique forwards; the third dorsal and the fourth costal are in the ciliæ. There is a silvery white apical spot. The dorso-apical portion suffused with brown: costal and dorsal ciliæ brown: apical ciliæ silvery white, with a dark brown oblique streak (hook). Hinder marginal line at the base of the ciliæ brown. Under surface and legs silvery or opalescent, streaked and banded with golden brown. *Alar ex.* scarcely $\frac{1}{5}$ inch.

It belongs to Zeller's section A, having nine veinlets given off from the discal cell; has the "hook" in the apical ciliæ; the scales of the vertex are not appressed, and, like those on the under surface of the second joint of the labial palpi, they are long and loose.

It is a very handsome insect, and the ornamentation seems to be intermediate between *G. ononidis* and *G. pavoniella*, as figured in Stainton's *Nat. Hist. Tin., v. 8, plate 5*. The wings are rather more golden than in *ononidis*, and not so much suffused with brown along the centre, and it lacks the *brown basal* and first dorsal white streak represented in that species. The wings are not so much golden as in *pavoniella*, but it has the basal streak exactly as in that species, and the apical hook; but it lacks the last small dorsal streak or spot of that species, and has the apical spot as in *ononidis*, whilst *pavoniella* has none.

The larva is yellowish, and does not change colour previous to pupation. It mines the leaves of the Virginia Plantain *(Plantago Virginica)* in September, October and November. The mine is at first narrow, winding and linear, filled with frass, ending in a large bladder-like mine, the upper and lower cuticles being puffed out. The linear portion is only visible under the lens. It remains in the mine until it is ready to become a pupa, which it does in a small *nidus* on the ground, and the imago emerges in less than a week. Kentucky. Common.

Gracillaria 12 lineella. N. sp.

Palpi and legs white, flecked and spotted with blackish on their outer surfaces. Antennæ pale greyish, annulate with pale fuscous. Head and thorax greyish-white mixed with fuscous. Anterior wings, to the naked eye, pale greyish (which the lens shows to be the intermixture of whitish and fuscous scales), with fuscous spots and blotches on the disc. The posterior margin with twelve alternate white and fuscous streaks small and not distinct, except the tenth, which is situated beyond the apical third, and extends obliquely backwards to the costal margin, where it is confluent with the eleventh dorsal streak, which curves forwards from its base on the

dorsal margin to its union with the tenth streak on the costal margin, there enclosing a triangular dark brown dorsal patch. The twelfth streak is narrow, and extends along the dorso-apical margin, and opposite to it is a distinct costo-apical triangular white spot. There is a series of indistinct small white streaks along the costa, three of which, just beyond the middle, are larger and more strongly dark margined. The first of the three is long, narrow, oblique, and suddenly curved backwards on the disc. The second is nearly concealed by its dark margin, which is pronounced forming an oblique curved black streak, which reaches the middle of the apical part of the wing just over the third streak, which is shorter, white, distinct, and decidedly dark margined on both sides and around the apex. Apex golden brown, ciliæ golden brown, tipped with silvery. *Alar ex.* $\frac{3}{8}$ inch. Larva and food plant unknown. Kentucky; not common.

LIST OF COLEOPTERA

TAKEN AT GRIMSBY, ONT., BY MR. J. PETTIT.

Continued from page 107, Vol. III., CAN. ENT.

CHRYSOMELIDÆ.

ORSODACNA, *Latr.*
- vittata, *Say.*
- *atra, *Lac.*

DONACIA, *Fabr.*
- proxima, *Kirby.*
- lucida, *Lac.*
- palmata, *Oliv.*
- subtilis, *Kunze.*
- æqualis, *Say.*
- cuprea, *Kirby.*
- pusilla, *Say.*
- Kirbyi, *Lac.*

SYNETA, *Esch.*
- tripla, *Say.*

LEMA, *Fabr.*
- LEMA trilineata, *Oliv.*

UROPLATA, *Chevr.*
- quadrata, *Fabr.*
- *pallida, *Say.*

CASSIDA, *Herbst.*
- signifer, *Hbst.*
- clavata, *Fabr.*
- aurichalcea, *Fabr.*
- pallida, *Herbst.*

CEROTOMA, *Chevr.*
- caminea, *Fabr.*

PHYLLOBROTICA, *Redt.*
- decorata, *Say.*
- discoidea, *Fabr.*

LUPERUS, *Geoffr.*
- meraca, *Say.*

Species marked with an asterisk * have not before been included in the list of Canadian Coleoptera.

DIABROTICA, *Chevr.*
12-punctata, *Fabr.*
vittata, *Fabr.*
GALERUCA, *Geoffr.*
externa, *Say.*
sagittariæ, *Kirby.*
*notulata, *Fabr.*
TRIRHABDA, *Lec.*
canadensis, *Kirby.*
ŒDIONYCHIS, *Latr.*
vians, *Ill.*
quercata, *Fabr.*
GRAPTODERA, *Chevr.*
chalybea, *Ill.*
DISONYCHA, *Chev.*
pensylvanica, *Brongn.*
alternata, *Ill.*
triangularis, *Say.*
collaris, *Fabr.*
SYSTENA, *Chevr.*
frontalis, *Fabr.*
*marginalis, *Ill.*
CREPIDODERA, *Chevr.*
nana, *Say.*
*copalina, *Fabr.*
pubescens, *Ill.*
PHYLLOTRETA, *Chevr.*
striolata, *Ill.*
PSYLLIODES, *Latr.*
punctulata, *Mels.*
DIBOLIA, *Latr.*
aerea, *Mels.*
LABIDOMERA, *Chevr.*
trimaculata, *Fabr.*
POLYGRAMMA, *Chevr.*
10-lineata, *Say.*
CALLIGRAPHA, *Chev.*
scalaris, *Lec.*
spiræ, *Say.*
CALLIGRAPHA, *Chev.* (Con.)
philadelphica, *Linn.*
Bigsbyana, *Kirby.*
MELASOMA *Dillwyn.*
scripta, *Fabr.*
interrupta, *Fabr.*
CHRYSOMELA, *Linn.*
vulgatissima, *Linn.*
PRASOCURIS.
phellandrii, *Linn.*
varipes, *Lec.*
GASTROPHYSA, *Chev.*
polygoni, *Linn.*
PHAEDON, *Meg.*
viride, *Mels.*
METACHROMA, *Chevr.*
4-notata, *Say.*
dubiosa, *Say.*
aterrima, *Oliv.*
BROMIUS, *Chevr.*
vitis, *Fabr.*
CHRYSOCHUS, *Chevr.*
auratus, *Fabr.*
HETERASPIS, *Dej.*
curtipes, *Mels.*
GLYPTOSCELIS, *Chevr.*
hirtus, *Oliv.*
PACHNEPHORUS, *Chevr.*
10-notatus, *Say.*
*pubescens, *Lec.*
PACHYBRACHIS, *Suffrian.*
*subfasciatus, *Lec.*
*mollis, *Hald.*
tridens, *Mels.*
MONACHUS, *Suffr.*
saponatus, *Fabr.*
CRYPTOCEPHALUS, *Geoffr.*
*guttulatus, *Oliv.*
*sellatus, *Suffr.*

CRYPTOCEPHALUS, *Geoffr.* (Con.)
mammifer, *Newm.*
*quadruplex, *Newm.*
auratus, *Fabr.*
*catarius, *Suffr.*

COCCINELLIDÆ.

HIPPODAMIA, *Muls.*
13-punctata, *Linn.*
convergens, *Guer.*
parenthesis, *Say.*
maculata, *Geer.*
COCCINELLA, *Linn.*
ophthalmica, *Muls.*
bipunctata, *Linn.*
picta, *Rand.* var.
trifasciata, *Linn.*
transversoguttata, *Fald.*
lacustris, *Lec.*
novemnotata, *Herbst.*
sanguinea, *Linn.*
*cardisce, *Randall.* 1.
*similis, *Randall.* 2.
COCCIDULA.
*lepida, *Lec.*
MYSIA, *Muls.*
*pullata, *Say.*
15-punctata, *Oliv.*
PSYLLOBORA, *Muls.*
20-maculata, *Say.*
CHILOCORUS, *Leach.*
bivulnerus, *Muls.*
BRACHYACANTHA, *Muls.*
ursina, *Fabr.*
HYPERASPIS, *Redt.*
elegans, *Muls.*
SCYMNUS, *Kug.*
*ornatus, *Lec.*
*flavifrons, *Mels.*
*punctatus, *Mels.*
*terminatus, *Say.*
collaris, *Mels.*
lacustris, *Lec.*
SACIUM, *Lec.*
fasciatus, *Say.*
*obscurus, *Lec.*

1. Taken by Dr. Milward. 2. Taken by Dr. Milward.

NOTES OF A COWCATCHER RIDE THROUGH NEBRASKA.

BY CHARLES R. DODGE, WASHINGTON, D.C.

DURING my recent trip through Colorado and adjacent territory, as a member of the New York agricultural editorial excursion party, I made it a point to collect whenever an opportunity was offered. Through Kansas, the three-minute stops at the stations, many of which are out on the open plains, afforded me opportunity for turning over old railroad ties, &c.; for beating the herbage and rank vegetation at the sides of the track, or for searching in the dry grass and weeds for *Orthoptera*. In the mountains it was an easy matter to jump from the ambulance or to follow behind it,

stopping when occasion demanded; but the most novel collecting was during the trip through Nebraska.

It was our good fortune to have a special train from the Platte river to Omaha, and as the novelty of riding in the cabin of the locomotive had long since worn off, the cow-catcher was next resorted to, and with results that had not been anticipated. Sitting carelessly on the beam that supports the iron framework, "nursing one leg," I was suddenly struck in the face by some small object that decidedly made an impression; others came in quick succession, and before I could solve the problem, a large grasshopper (*Œdipoda Haldemanni*, Scudd), struck my boot, glanced and rolled into my lap. Having no bottle at hand, I immediately secured it in a leaf from a railroad land document that had been handed me, and placed it in my pocket. By this time we were running at 40 miles an hour, and grasshoppers pelted us like driving sleet. They seemed to fly or jump up from the track at our approach, but not in sufficient time to get out of the way, and so we literally ran into them. Those that struck the engine were generally injured—in some cases completely *smashed*—and blown off at either side, and it was only those that happened to strike on our clothing that were worth preserving. Occasionally a stray dragon fly, or an unlucky wasp would get in the way, and even tiger beetles flew into the trap; now and then a large wingless *Brachypeplus*, with its coarse spines, would make its presence felt; but all were fish that came to the net, and soon the leaves of my pamphlet were exhausted, all my pockets filled, and by the time the station was reached, I was only too glad to return to the car and bottle my treasures. In less than half an hour I took more insects than I had room for, and what was still better, found two new species.* The following is a list of the *Orthoptera* taken:—

Brachypeplus magnus.
Opomala bivittata Serv.
Pezotettix megacephala Thos. N. sp.
Caloptenus spretus Uhler.
" *femur rubrum* Burm.
" *bivittatus* Say.
Acridium emarginatum Uhler.
Œdipoda carolina Linn.
" *trifasciata* Say.
" *tenebrosa* Scudd.
" *Haldemanni* Scudd.
" *undulata* Thos. N. sp.
" *collaris* Scudd.
And two or three other species not yet determined.

* Two other species taken during the trip are found to be new, and have been described by Mr. Thomas. *Acridium frontalis* from Kansas, and *Caloptenus Dodgei*, Colorado.

We were much interested in watching the birds as they flew up before us. The majority of the flock would pass to one side or the other, but one or two would attempt to keep ahead of the engine, straining every muscle, till finally they would fall apparently exhausted, or be struck and drop lifeless. One was captured alive by simply reaching out the hand and taking it.

On all future trips through new country, I shall endeavour to get into the good graces of the conductor and engineer, and thus secure a place under the headlight, for, aside from its being a good "collecting ground," one gets a splendid view of the country, without dust, without the usual jolting, and with a delightful breeze into the bargain, though it doesn't do to reflect too much on the possibility of shipping a cow or two.

NOTES ON A NEW ORTHOPTEROUS INSECT.

BY PROF. C. THOMAS, WASHINGTON, D. C.

Sub-Fam. CONOCEPHALINÆ.*

Copiophora mucronata. Nov. sp.

CONE of the vertex smooth on the margins, apex mucronate. Mesosternum bidentate. Green; labrum, clypeus and underside of the cone yellow.

Male and Female. Cone of the vertex standing obliquely forward, apex mucronate, the minute spine slightly deflexed, especially in the female; the sides parallel from the base a little above the first joint of the antennæ, where they are slightly angulate; not serrated or granulated on the margins; front side has, near the base, a prominent tubercle; there is also a tubercle below this between the antennæ. Face oblique, smooth; occiput smooth. Pronotum rounded, not carined, densely punctured; on the dorsum there is generally a glabrous, semi-circular spot; there are also some irregular glabrous impressions on the sides; front margin rounded; posterior margin nearly straight, slightly rounded at the humerus where there is an entering angle. Elytra passing the abdomen about one third their length: upper margin straight from the dorsal angle; lower

* I have here, and expect in the Synopsis of the Acrididæ of the United States, which I am at work on, to adopt the termination INAE for the sub-families.

margin rounded from the base to the apex; apex angled. Wings about as long as the elytra. Ovipositor about as long as the body, nearly straight, lanceolate at the apex; cerci of moderate length, swollen, slightly curved, with a slender, pointed apex. The abdomen of the male has, at the apex of the last ventral segment, the usual cylindrical appendages; the super-anal plate bilobed; no cerci apparent in the male I have seen.

Posterior lateral angles of the mesosternum furnished with a prominent spine. External carinae of the femora furnished with strong spines; also a sharp spine each side of the apex of each, projecting forward. Anterior tibiæ without spines in front; middle with two rows above, two in each row; the posterior with two rows beneath. Anterior coxæ furnished externally with a strong curved spine. Antennæ very long and slender.

The legs of the male are quite hairy.

Colour. Body and elytra a uniform bright pea-green: underside and edges of the frontal cone a bright yellow; labrum and clypeus yellow; mandibles deep piceous black, except the upper external angles, which are green. Ovipositor dull yellow, slightly striped with fuscous near the apex. Tarsi pale fuscous. Eyes brown.

Dimensions. ♀ Length from base of cone to top of abdomen, 1.5 in.; cone .31 in.; elytra 1.26 in.; posterior femora .83 in.; posterior tibiæ .82 in.; ovipositor 1.5 in. ♂ Length 1.25 in.; cone .25 in.; elytra 1.1; posterior femora .68 in.; posterior tibiæ .65 in.

As before remarked, this species has evidently been introduced with plants brought from some tropical section. The only plants received at the Department last fall or winter from the tropics were from Central America and Cayenne.

If the mesosternal spines, which are very prominent, do not distinguish it from other species, then the very interesting inquiry arises, has it been produced from the eggs of some known species, the variations between the perfect insects having been produced by the different circumstances under which they have grown to maturity?

So far as I am aware, the following list embraces all the species hitherto described:—

C. cornuta, Serv.—Para.
C. mexicana, Sauss.—Mexico.
C. lucifera, Burm.—Bahia.
C. flavo-scripta, Walk.—Venezuela.
C. longicauda, Serv.—Cayenne.
C. megacephala, Burm.—Jole St. Johanna.
C. gracilis, Scudd.—Napo, or Maranon.
C. cuspidata, Haan.—Brazil.

This species has some strong resemblances to *C. gracilis*, Scudd, but is evidently a different species.

Prof. Glover's figures will be found as follows :—Female pl. VIII., fig. 14 (Orthoptera) ; Male pl. VII., fig. 8.

THE ACORN MOTH.

Holcocera glandulella. N. sp.

BY C. V. RILEY, ST. LOUIS, MO.

On page 118, of Volume III., I briefly referred to a little inquilinous acorn moth by the proposed name of *Gelechia glandulella.* Careful examination shows that it differs from the genus *Gelechia*, principally by the peculiar construction of the basal joint of the ♂ antennæ, and that it belongs to the genus *Holcocera* as characterized by Clemens (Proc. Ent. Soc. Phil., II., p. 121). As the insect has been the cause of some dispute between myself and Mr. Couper, I send you the following description :—

Holcocera glandulella. N. sp.—*Imago.* Alar expanse 0.50—0.80 inch. Front wings silvery-gray, more or less distinctly suffused and marked with fuscous ; two distinct dark discal dots : a pale transverse stripe across the basal third of wing, slightly elbowed outwardly at its middle : this stripe is well relieved behind by a dark shade, and this shade generally extends from the elbow to the costa above discal spots, forming a more or less distinct triangular shade in the anterior middle portion of the wing : three tolerably distinct dusky marks surround the discal dots on the outside, and a series of minute vein-specks mark the posterior margin ;. fringes concolorous. Hind wings of a more glossy, warmer, brownish-gray, the reflection inclining to golden in certain lights ; fringes concolorous, but not glossy. Under surface uniformly of same tint as hind wings. Head, thorax and legs concolorous with front wings ; abdomen, with hind wings, the joints often ringed with a paler shade. Apical joint tipped with yellowish, or pale fulvous hairs, the ovipositor of ♀, which may be exserted one-half the length of abdomen, of same colour. The basal antennal joint of ♀, the nodule on ♂ antennæ, base of palpi, and sometimes tarsi, also tinged with fulvous.

Described from 8 ♂, 20 ♀, all bred from acorns. The intensity of

the dark shadings is quite variable, and in some specimens the basal space shows decidedly paler than the rest of the wing.

Larva. Length 0.35—0.50 inch. Largest in middle of body. Translucent grayish-white, with blue-black, vesicular, dorsal marks. A conspicuous light brown head, darker cervical shield, and small anal plate. Head with the mouth parts darker; epistoma well defined by fine brown lines. Piliferous spots quite noticeable from their darker polished surface, the hairs springing from them pale and soft; placed in a transverse row on joints 2 and 3, and on joints 4—12, three laterally and four, nearly in a square, dorsally. The normal complement of legs which are of the same colour as body.

I have found the species in Vermont, New Jersey, New York, Illinois and Missouri.

This insect may be found in the larva state all through the fall, winter and early spring months, especially in acorns that have been infested with the acorn weevil (*Balaninus rectus*, Say), and I gave some further account of it on the page already referred to. The larva is readily distinguished from that of *Balaninus rectus*, as the latter of course lacks the legs, cervical shield, anal plate and piliferous spots, so characteristic of the former, and is besides more wrinkled, more yellowish, less translucent and does not show the blue-black markings on back.

MISCELLANEOUS NOTES

THE AMERICAN ENTOMOLOGIST.—Editors *Rural World*: I regret to inform you that, contrary to the announcement a year ago, this magazine will not be continued during the coming year. The cost of publishing a paper so profusely illustrated with original figures is great, and the publishers, Messrs. R. P. Studley & Co., have lately concluded to discontinue it, as they have not met with sufficient financial encouragement. I have, however, since they so decided, purchased from them all the illustrations and all interest in the magazine, and hope at no distant day to recommence its publication myself. Meanwhile, I take this means of thanking the many subscribers who, during the year, have sent in expressions of encouragement and appreciation, or who have signified their intention of renewing subscription. I shall ever be glad to hear from them on entomological subjects, and to render them what little service lies in my power. By making this announcement through your columns, you will oblige.

St. Louis, Mo., Dec. 10, 1871. C. V. RILEY.

ORTHOPTERA.—A case of *Orthoptera*, forwarded from America more than a year ago, has just reached me, on account of the recent war, and the obstruction of freight on the railways centering in Paris. As it was undoubtedly stored in damp places, a large proportion of the specimens were covered with mould, some of them so as to be quite invisible. They had, however, suffered very unequally. On examination, I found that specimens which had been pinned in some Paris-made pasteboard boxes, with cork bottoms, had suffered most; those contained in wooden boxes lined with cork much less so, although still presenting a very unsightly appearance; while those placed in two wooden boxes, lined with aloe-pith, instead of cork, were *entirely uninjured*. The position of the boxes in the case seemed to have nothing to do with their immunity, as they were not beside each other.

I would, therefore, recommend the use of aloe-pith for the lining of insect boxes when they are to be used for distant transportation—especially by water. SAMUEL H. SCUDDER.

Menton, France, Dec. 15, 1871.

KIRBY'S BRITISH-AMERICAN INSECTS.—The types of the species described by Kirby (which we are now reprinting) in the Fauna Boreal Americana, are still in existence, we are glad to learn, at the British Museum.

CRAB APPLES.—Do not start, Entomological reader; this is not the name of a new species of insect, but we do not know where else to acknowledge the receipt of a little box of "Marengo Winter Siberian Crab-apples," sent us by Messrs. Andrews, Herendeen & Jones, of Geneva, N.Y. They are pretty in appearance, pleasant in taste, and are said to especially excel in the quality of keeping.

AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

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DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA.

NO. I.

BY E. T. CRESSON, PHILADELPHIA, PA.

Family ICHNEUMONIDÆ.

Genus MESOCHORUS, Grav.

THIS genus belongs to the sub-family "Ophionides," of Holmgren, and is distinguished from all the other genera by the large, rhomboidal areolet, or second submarginal cell, of the anterior wing. The abdomen is oblong-fusiform, slender at base, and more or less compressed at tip, that of the ♂ generally furnished with two slender setæ.

The species are quite small in size, not exceeding three tenths of an inch in length, and are few in number. Those known to me may be tabulated as follows:—

Abdomen entirely black.....ATRIVENTRIS.
Abdomen black, with apical margin of second segment and the third entirely luteous:
Large; face and posterior coxæ blackish.....AGILIS.
Small; face dusky, with pale orbits; posterior coxæ luteous. LUTEIPES.
Abdomen black, with most of second and third segments luteous.....SCITULUS.
Abdomen black, with apical half of second, and the remaining segments, except apical margins, luteous .....AMERICANUS.
Abdomen luteous or honey-yellow, with first and part of second segments black:
Thorax above and occiput black; second abdominal segment black, except narrow apical margin.....BASALIS.
Thorax and head entirely honey-yellow; apical half of second abdominal segment honey-yellow.....TOTONACUS.
Abdomen luteous, with sides of first, and two oblique marks on base of second segment, black.....OBLIQUUS.
Abdomen, thorax and head entirely honey-yellow.....MELLEUS.

1. Mesochorus atriventris. N. sp.—♂. Head yellowish-white; anterior orbits, lower half of cheeks, mandibles and palpi, paler; the front behind antennæ, vertex, occiput, upper half of cheeks and tips of mandibles piceous black; antennæ nearly as long as the body, slender, blackish,

base rufo-piceous; thorax laterally and beneath honey-yellow; mesothorax and scutellum fusco-ferruginous, the former darker laterally; metathorax piceous-black, the flanks honey-yellow; tegulæ yellowish-white; wings hyaline, iridescent, nervures luteo-fuscous, stigma luteous; legs luteous, posterior tibiæ paler, the extreme base and apex fuscous, their tarsi dusky towards the apex; abdomen long, slender, polished black, apical margin of third segment obscurely testaceous; venter luteous. Length 2½ lines.

Hab.—Illinois. Easily distinguished from the other species by the black abdomen.

2. *Mesochorus agilis*, Cresson. *Proc. Ent. Society Phila., April, 1865, p. 266.*

♀. Black, polished; most of clypeus, extreme lower portion of cheeks, mandibles except tips, and the palpi, yellowish; antennæ longer than the body, slender, brown-black; tegulæ and a spot before pale yellowish; wings ample, hyaline, iridescent, nervures pale fuscous, yellowish at base of wing, as well as costa and stigma; legs obscure luteous, posterior coxæ fuscous, tips of their tibiæ and their tarsi dusky; abdomen piceous black, polished, apical margin of second segment, and the whole of the third, obscure luteous; venter stained with yellowish. Length 3¼ lines.

Hab.—Colorado. This is the largest species known to me.

3. *Mesochorus luteipes. N. sp.*—♀ Black, shining; face, mouth, and lower part of cheeks luteous; middle of face and tips of mandibles dusky; antennæ nearly as long as the body, slender, fuscous, scape pale honey yellow; prothorax beneath and tegulæ luteous; wings hyaline, iridescent, nervures and stigma pale fuscous; legs luteous, posterior coxæ and femora slightly tinged with fuscous, the extreme base and apex of their tibiæ dusky, also more or less of their tarsi; abdomen above piceous-black, polished, most of the third segment dull luteous, apical segments have a brownish tinge; venter rufo-testaceous. Length 2 lines.

Hab.—New Jersey. Much smaller than *Agilis*, which it resembles in having the thorax almost entirely black; it is, however, abundantly distinct.

4. *Mesochorus basalis. N. sp.*—♀. Honey-yellow; spot covering ocelli and confluent with a large transverse mark on occiput, tips of mandibles, mesothorax, scutellar region, metathorax entirely and spot beneath wings, black; antennæ ferruginous; face luteous, with small dusky stains; two faint longitudinal lines on mesothorax and most of scutellum, honey-yellow and concolorous with pleura; tegulæ pale luteous;

wings hyaline, iridescent, stigma fuscous, nervures paler; legs pale honey-yellow, coxæ and posterior tibiæ luteous, tips of the latter dusky, as well as most of the tarsi; abdomen honey-yellow, the first, and the second segments except apical margin, black. Length 2¼ lines.

Hab.—Massachusetts.

5. *Mesochorus americanus. N. sp.*—♀. Pale honey-yellow; spot enclosing ocelli, sometimes more or less of occiput, tips of mandibles, mesothorax and more or less of metathorax above, black; antennæ as long as body, slender, varies from rufo-testaceous to fuscous, with the scape luteous; scutellum and region honey-yellow; tegulæ luteous; wings hyaline, iridescent, nervures and stigma pale fuscous; legs pale luteous, almost white, the femora tinged with yellowish, extreme apex of posterior tibiæ blackish; abdomen fusiform, very slender at base, first segment above entirely black, second luteous, with the basal half black, the margin indented anteriorly, so that in some specimens the black is divided into two subquadrate spots, remaining segments luteous, with fuscous apical margins; venter luteous. Length 2½ lines.

Hab.—Pennsylvania, Delaware, Illinois.

6. *Mesochorus totonacus. N. sp.*—♀. Pale honey-yellow, metathorax and abdomen darker, smooth and polished; tips of mandibles, antennæ except base, first segment of abdomen and basal half of second, black; wings hyaline, iridescent, nervures and stigma blackish; tips of posterior femora, of their tibiæ and of all the tarsi, dusky. Length 2¼ lines.

Hab.—Orizaba, Mexico.

7. *Mesochorus vitreus*, Walsh. *Ins. Inf. to Veg. in Ills., p. 36.*

"♂. General colour light rufous; eyes and ocelli black; antennæ fuscous, except towards base; upper surface of thorax sometimes fuscous; intermediate and posterior tibiæ with spurs equal to one-fourth of their length, posterior knees slightly dusky, tips of posterior tibiae distinctly dusky; wings hyaline, nervures and stigma dusky; abdomen, a translucent yellowish-white in its central one-third, the remaining two-thirds piceous-black, with a distinct narrow yellowish annulus at the base of the third joint. The ♀ differs from the ♂ in the head from the mouth upwards being piceous; the thorax and pectus are also piceous-black; abdomen as in the ♂. Length .08—.13 inch."

Hab.—Illinois. Bred from the Army-worm (*Leucania unipuncta*, Haw.). This species is unknown to me. The ♂ seems to be closely allied to that of *scitulus, n. sp.*, but the ♀ is entirely different.

8. Mesochorus scitulus. N. sp.— ♂ ♀. Pale honey-yellow or luteous; head broad; spot covering ocelli, and tips of mandibles black; occiput of ♀ more or less fuscous; antennae long and slender, pale testaceous, sometimes slightly dusky, scape paler; mesothorax fuscous in ♀, honey-yellow with dusky sides in ♂; scutellum and region honey-yellow; disk of metathorax more or less blackish or fuscous; tegulae pale luteous; wings hyaline, iridescent, nervures and stigma luteous; legs pale luteous, apex of posterior tibiae and tips of tarsal joints dusky; abdomen fusiform, very slender at base, black above, with a large discal pale luteous spot covering apical half or two-thirds of second, and basal half or two-thirds of third segments; venter pale luteous; apex of ♂ with two long slender setae; ovipositor of ♀ longer than basal segment. Length ½ line.

Hab.—Pennsylvania. Twenty-three specimens, along with four specimens of a *Pezomachus*, bred from a bunch of bright lemon-yellow cocoons, (probably those of a *Microgaster*), found attached to a blade of grass.

9. Mesochorus obliquus. N. sp.— ♀. Pale honey-yellow, orbits and mouth luteous; sides of mesothorax faintly dusky; tegulae white; wings hyaline, iridescent, stigma fuscous, nervures pale; legs pale luteous, posterior femora yellowish, their tibiae fuscous at base and almost black at apex; lateral margins of first abdominal segment and two oblique marks at base of second segment black; extreme sides of third segment dusky. Length 2 lines.

Hab. — Pennsylvania. Distinguished by the two oblique marks at base of the second abdominal segment.

10. Mesochorus melleus. N. sp.— ♂. Uniformly honey-yellow; spot enclosed by ocelli, and tips of mandibles blackish; antennae as long as body, slender, flagellum dusky; wings hyaline, iridescent, stigma fuscous, nervures much paler; legs luteous, extreme base and apex of posterior tibiae and tips of tarsal joints dusky; abdomen robust, honey-yellow, apex somewhat discolored. Length 2 lines.

Hab.—Pennsylvania. Easily distinguished by the immaculate, uniform honey-yellow colour of the body, which is more robust than usual.

THE ANNUAL REPORT on Insects Noxious or Beneficial to Agriculture, which, by the Statute of Incorporation, is required to be furnished by the Entomological Society of Ontario to the Commissioner of Agriculture, is now in the printer's hands, and will be forwarded to the Members of the Society as speedily as possible.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from page 12.

GRACILLARIA.

5. Gracillaria (Coriscium?) albinatella. N. sp.

Second joint of the labial palpi with a distinct tuft at the apex beneath. Head and palpi silvery white. Second joint of the labial palpi brownish-gray, except at the tip. Antennae, thorax and anterior wings pale brownish-gray, in some lights silvery or golden. Thorax with a longitudinal median white streak produced gradually, widening along the dorsal margin of the anterior wings to the basal third, when it is intersected by a somewhat oblique *costal* white streak. Another oblique costal white streak about the basal fourth; a third one longer and narrower, situated beyond the middle of the costa, and a fourth and large one near the apex, and extending into the ciliae. Opposite the space between the second and third costal streaks is a large white triangular dorsal spot with its internal margin convex. Each of the costal and dorsal streaks is dark margined on both sides and around the apex. In the apex behind the costo-apical white spot is a curved golden-brown streak bordered behind by a brilliant white streak on the dorso-apical margin. Ciliae white, stained at the extreme tip with fuscous, with a rather wide, short, reddish-golden, hinder marginal line at the base of the apical ciliae, and three or four minute fuscous spots in the ciliae beyond it. Posterior wings bluish smoky. Legs golden-brown, spotted and streaked with white. Tarsi white, annulate with brown; posterior tibiae white. *Alar ex.* scarcely ⅓ inch. Kentucky.

6. Gracillaria salicifoliella. N. sp.

Face and palpi white, with the apex of the labial palpi and a spot on the outer surface of the second joint, and one on the third, brown. Vertex white, suffused with brownish in front, and with a blackish patch at the base of the antennae, which are dark brown. Thorax and dorsal portion of the wings to the ciliae, white; costal portion blackish-brown; its line of junction with the white portion *twice indented or scalloped towards the fold.* Five costal white streaks, the first about the middle of the costa, curving backwards, long, and narrowed towards its apex, sometimes

almost overspread with blackish-brown scales on the white ground, produced along the costa towards, but not to, the base; the second is shorter, wider, *suffused with ochreous and blackish; not distinct, and sometimes only distinguishable as a paler spot in the blackish portion of the wing*, produced along the costa to the first streak; the third is larger, distinct, curving backwards to the centre of the apical part of the wing, and gradually narrowing; *it forms the posterior margin of the blackish portion of the wing, which curves around it, narrowing to a point in the centre of the apical part of the wing.* Apical part of the wing, as far as the third costal streak, brownish-ochreous, with an indistinct brown apical spot. Fourth and fifth costal streaks in the brownish-ochreous part of the wing. Ciliae silvery-gray, with two brownish hinder marginal lines, one at the base; the other near the apex, and continued into the "hook." *Alar ex.* 7/8 inch.

This species resembles the European *G. Kollariella*, as figured in Stainton's *Nat. His. Tin.*, v. 8, p. 128, and plate 3, fig. 3, but probably is nearer still to *G. Gradatella*, and may prove to be that species, the food-plant of which is unknown. The principal differences between it and *Kollariella*, are indicated by the italics.

The larva was not observed until August, and some of the mines were then empty. I found it abundant from that time until the fall of the leaves in November. It mines the upper surface of the leaves of different Willows (*Salix longifolia*, native, and *S. alba* and *S. Babylonica*, foreign species). It does not leave one mine to form another, but continues in one mine until ready to become a pupa; and sometimes the mine covers nearly the entire leaf. It pupates under a dense semi-transparent white web over the midrib; usually of a different leaf, though I have occasionally found it on the under side of the same leaf mined by it. It remains in the pupa state about two weeks, and the imago probably hybernates. Common in Kentucky.

7. *Gracillaria desmodifoliella*, Clem. *Proc. Ent. Soc. 1865, p. 145;* previously described by Dr. Clemens in *Proc. Acad. Nat. Sci., Phila., 1860, p. 7*, as *G. violacella*. The last description was made to correct the first, but from a single bred specimen in my possession, the first description seems to be as nearly correct as the last. Probably it is a somewhat variable species. It feeds on the leaves of species of *Desmodium*, and if it is ever a miner (as it most probably is), it is so for a very short time only, as the larvae are found, whilst still very small, rolling the leaves from the apex downwards, eating the underside. It frequently leaves one roll

and makes another. It pupates over the midrib under a dense but semi-transparent white web on the upper side of the leaf. Rather an inconspicuous insect; the costal half of the wings yellowish, with a few black spots on the middle of the margin. Dorsal half yellowish-purple, faintly iridescent, with a few small blackish dots along the centre of the disc. *Alar ex.* about ⅓ inch. Kentucky. Common.

8. Gracillaria Packardella. N. sp.

Face and palpi snowy-white; the joints of the palpi tipped with golden. Vertex, antennae, thorax, and base of the wings pale lemon-yellow, each antennal joint tipped above with fuscous. Anterior wings pale reddish-orange, with purple and golden reflections, and becoming deeper towards the apex, with a large triangular pale lemon-yellow spot about the middle, very wide on the costa, and its apex almost touching the dorsal margin. Ciliae pale yellowish, faintly flecked with reddish-orange or golden. Anterior surface of the legs reddish-orange, tinged with fuscous. *Scales of the head loose, not appressed.*

Larva and food-plant unknown, but from circumstances, I suspect it to be an Oak-feeding species; and I think that it passes the winter in the pupal state, from finding fresh specimens of it abundant in April and May. *Alar ex.* about ½ inch. Kentucky.

I took it resting upon fences under Beech and Oak trees; on which also, there were a great many of the bracts, or outer reddish envelopes, of the Beech leaf-buds (which were then expanding, and throwing off these envelopes). At a distance of more than a yard it was scarcely possible to distinguish the *Gracillaria* from these envelopes. I have never found a mine or larva of this genus on the Beech; and have found the imago on Oaks at a great distance from any Beech trees.

I have named it in honor of Dr. A. S. Packard, jun., author of the "Guide."

9. Gracillaria purpuriella. N. sp.

Violaceous, reddish or brownish-purple, according to the light. Face pale violaceous, flecked with brownish-purple. Antennae brown, tinged with purplish, faintly annulate with white at the base of each joint; palpi pale purplish. The triangular white spot about the middle of the costa is nearly equilateral; its anterior margin is a little concave, the apex reaching the fold, and it has four small spots of the general hue situated in it upon the costa. Ciliae bluish fuscous. Posterior femora white at the tip, and with a wide white band about the middle, and its under surface

entirely white. Posterior tibiae and inner surface of intermediate tibiae white. Tarsi pale grayish-fuscous, faintly annulate, with white at the joints. Abdomen purplish-fuscous on a white ground. *Alar ex.* ½ inch.

The larva mines the leaves of the Willow *(Salix longifolia)* for a very short time, then leaving the mine, it rolls the leaves from the tip upwards, into various forms (usually a cone or helix of three spirals). I first found it in September and October, and do not know whether it can be found earlier or not. It frequently leaves one roll and makes another, and when ready to pupate, makes a dense semi-transparent web over it, upon the ground, not on the leaf, as in many species. The imago emerges in the fall, and most probably, hybernates.

I have bred a great many species of Ichneumonides and Chalcidiidæ parasites from the different "Micros." Among others, the following, which I take to be a *Eulophus*, though I can distinguish but *eight* antennal joints. Possibly, however, one of the three terminal joints may be composed of *two* or more *compact* joints, but they are so thickly clothed with blackish hairs that I can not discover it without dissection, which, as I have but the single specimen, I do not wish to resort to. Some allied genera have the terminal joint composed of *three compact* joints; but that would make the antennae in this species *10-jointed*, whereas, in *Eulophus*, they are *9-jointed*.

The antennae are black, and the third, fourth and fifth joints each give off, internally from the base, a plumose branch about as long as the portion of the stalk beyond it. Eyes bronzy brown. Head and thorax bluish-green, densely punctured. Legs and tarsi white, except the posterior *tibiæ* and femora, which are pale fuscous; abdomen blackish, with a pale whitish band across the tergum near the base *lon.* 3/32 inch. The living insect seemed to be continually expanding and shutting its antennae, and plumes like fans.

Bred from larvae of *Gracillaria purpuriella*, and I call it *Eulophus Gracillariæ*.

10. *Gracillaria juglandiella. N. sp.*

Palpi white, flecked with dark brown, and second and third palpal joints tipped with brown. Face white; antennae, vertex, thorax and basal third of the anterior wings iridescent, deep blood-brown, purple or violaceous, according to the light. Antennae faintly annulate with whitish, and basal third of the wing faintly flecked with whitish. Trigonal mark faintly outlined, its anterior margin being the posterior margin of the

deep coloured basal third of the wing, and the mark itself being overspread with the same colour as the basal third, but a little paler, and scarcely at all distinguishable from the portion of the wing beyond it. Trigonal mark and apical portion of the wing beyond it, distinctly, but sparsely, flecked with white. The trigonal spot reaches nearly to the dorsal margin, and has two minute white streaks at each of its costal angles, and there is a very small white costal streak at the beginning of the ciliae. Ciliae of the general hue. Posterior wings and ciliae dark bluish-fuscous. Anterior coxae, trochanters, femora and basal half of the tibiae, of the general hue, except a white annulus on the middle of the femora, and two large white spots on its under surface, and a white annulus about the basal fourth of the tibiae. Tarsi and apical half of the tibiae white; tarsal joints tipped with brown; intermediate tarsi white, tipped with brown; posterior legs whitish. *Alar ex.* about $\frac{3}{16}$ inch.

The larva mines the underside of the leaves of the Black Walnut (*Juglans Nigra*) in August and September. After a time, it leaves the mine and goes to the upper surface, where it curls over the edge of the leaf, and passes the remainder of its larval and its pupal states; the imago emerging in the fall, and most probably hybernating.

In general colour it bears some resemblance to *G. purpuriella, ante*, but is a slenderer insect, and the trigonal mark, which is scarcely discernible in this insect, is very distinct in that. Kentucky. Rather common.

HEMIPTERA, HETEROPTERA AND DERMAPTERA (ORTHOPTERA) OF AMERICA TO THE NORTH OF THE UNITED STATES.

BY FRANCIS WALKER, F.L.S., LONDON, ENGLAND.

HEMIPTERA, HETEROPTERA.

PART 1. Family PACHYCORIDÆ.

HOMÆMUS exilis, *H. Sch.*, Nova Scotia.

Family ODONTOSCELIDÆ.

CORIMELÆNA unicolor, *Pal. Beauv.* Nova Scotia.
do nigra, *Dallas.* Lake Huron. St. Martin's Falls.

Family ASOPIDÆ.

ARMA modesta, *Dallas*. Nova Scotia.
ZICRONA cuprea, *Dallas*. St. Martin's Falls.
do marginella, *Dallas*. do

Family CYDNIDÆ.

ÆTHUS bilineatus, *Say*. Canada.
SEHIRUS ligatus, *Say*. Nova Scotia. Arctic America.

Family PENTATOMIDÆ.

EUSCHISTUS punctipes, *Say*. Nova Scotia.
do luridus, *Dallas*. do
ÆLIA trilineata, *Kirby*. Nova Scotia. St. Martin's Falls.
EYSARCORIS carnifex. *Fabr*. Nova Scotia.
PENTATOMA juniperina, *Linn*. Canada. (Inhabits Europe).
do picea, *Dallas*. St. Martin's Falls.
RHAPHIGASTER catinus, *Dallas*. Canada.
ACANTHOSOMA cruciata, *Say*. Nova Scotia. St. Martin's Falls. Arctic America.

Family ALYDIDÆ.

ALYDUS calcaratus, *Linn*. Nova Scotia. Arctic America. Inhabits Europe.

DERMAPTERA (ORTHOPTERA).

ISCHNOPTERA Pensylvanica, *Deg*. Canada.
GRYLLUS luctuosus, *Serv*. Canada.
NEMOBIUS vittatus, *Harris*. Nova Scotia.
ONTHOPHILUS maculatus, *Say*. do
DICTYUS sphagnorum, *Barnst*. St. Martin's Falls. Hudson's Bay.
XIPHIDIUM fasciatum, *Deg*. Nova Scotia.
PHANEROPTERA curvicauda, *Deg*. do
PHYLLOPTERA myrtifolia, *Serv*. Canada. Nova Scotia.
CALOPTENUS femur-rubrum, *Deg*. Nova Scotia. Arctic America.
do bivittatus, *Say*. Canada. Nova Scotia. St. Martin's Falls.
do borealis, *Fieber*. Labrador.
do fasciatus, *Barnst*. St. Martin's Falls.
do extremus, *Walk*. Arctic America.
do arcticus, *Walk*. do
PODISMA septentrionalis, *Scudd*. Labrador

ŒDIPODA Carolina, *Linn.* Canada. Nova Scotia.
do sulphurea, *Fabr.* Nova Scotia. Arctic America.
do phœnicoptera, *Germ.* St. Martin's Falls. Arctic America.
do rugosa, *Scudder.* Nova Scotia.
do corallipes, *Hald.* Arctic America.
STENOBOTHRUS curtipennis, *Harris.* St. Martin's Falls. Nova Scotia. Newfoundland. Arctic America.
do maculipennis, *Scudder.* Arctic America.
TETTIX granulata, *Kirby.* St. Martin's Falls. Arctic America.
do ornata, *Harris.* Nova Scotia. St. Martin's Falls.

Jan., 1872.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 233, Vol. iii.)

207. BUPRESTIS (STENURIS) DIVARICATA *Say.*—Length of body 10 lines. Taken in Canada by Dr. Bigsby; I received both sexes also from Massachusetts by the kindness of Dr. Harris.

[155.] Body below copper-bronzed, above dusky-bronzed; glossy; confluently punctured and wrinkled. Head with numerous branching, levigated, narrow spaces; eyes yellow surrounded with a black orbit; mandibles black at the tip; front longitudinally impressed in the centre: prothorax with numerous levigated spaces, obsoletely channelled; sides anteriorly rounded with a slight sinus near the base; basilar angles diverging: elytra very obsoletely furrowed, reticulated with numerous elevated lines, many scattered levigated spaces; bicarinated at the apex, the inner ridge being very short; suture terminating in a point; at their truncated extremity the elytra are divaricated and suddenly attenuated: the first segment of the abdomen, and the breast bones are hollowed out into a longitudinal channel: prosternum linear. [Exceedingly common in Canada; the larva bores into cherry and beech, and probably other trees. Belongs to the genus *Dicerca* Esch.]

208. BUPRESTIS (STENURIS) TENEBROSA *Kirby.* — Length of body 7¾ lines. Several taken in Lat. 65°, and in the Rocky Mountains.

Very like the species just described but much smaller. Body confluently punctured, upper surface black, with only the elevated parts glossy, lower bronzed-copper and glossy. Mouth and antennae bronzed; eyes black; front sculptured as in *St. divaricata:* prothorax uneven with shallow impressions and a broad dorsal channel; distinctly bisinuate at the base; surface with levigated elevations: scutellum very minute, impressed: elytra divaricated and suddenly attenuated at the apex, which is rounded and has a single ridge; surface rough with many concatenated and levigated irregular elevations, side of the tip bronzed: breast channelled underneath, but the first segment of the abdomen less conspicuously, prosternum nearly an isosceles triangle: hypopygium with three short teeth. [Taken in Canada, but not very common; "abundant at Lake Superior" (Le Conte). Belongs to *Dicerca.*]

209. [156.] BUPRESTIS (STENURIS) TENEBRICA *Kirby.*—Length of body 7¾—9 lines. Several taken in Lat. 54° and at Cumberland-house.

This species differs principally from *St. tenebrosa*, which in other respects it greatly resembles, in having the prothorax without any levigated elevations, and with the impressions, except the channel which is better defined, more obsolete. The elytra are distinctly furrowed, especially next the suture, with punctured furrows, and there is only a series of levigated elevations near the lateral margin; the attenuated apex of the elytra is longer, rather truncated, and underneath of a dark blue: the prosternum is linear, and the base of the abdomen scarcely channelled: the teeth of the hypopygium are longer and of a brilliant ruddy-copper.

VARIETY B. Smaller, upper surface black-bronzed. [Probably synonymous with *Dicerca lacustris* Lec., a species taken at Point Kewenan, on Lake Superior.]

[157]. 210. BUPRESTIS (ODONTOMUS) TRINERVIA *Kirby.*—Plate ii., fig. 9.—Length of the body 5⅓—5¾ lines. Several specimens taken in Lat. 54° and 65° and in the Rocky Mountains.

Body punctured, above black-bronzed, below copper-coloured and glossy. Head obscurely copper, confluently punctured and wrinkled, with a pair of levigated irregular elevations between the eyes; nose bilobed with divaricated lobes forming an obtusangular sinus; antennae copper with a testaceous pedicel: prothorax transverse, confluently punctured with several levigated spaces; lightly and widely impressed, impressions faintly gilded; disk channelled; sides very slightly emarginate; base with a double sinus, scutellum triangular, acuminated: elytra with the de-

pressed parts confluently punctured and very faintly gilded; with three subinterrupted longitudinal ridges connected by transverse levigated elevations; the two external ridges become confluent and proceed as a single ridge to the apex; lateral margin towards the apex minutely serrulate: back of the abdomen of a fine silky green: underside of the body thinly planted with hoary hairs; prosternum constricted in the middle and terminating towards the anus in a dilated trilobed point: shoulders much incrassated, armed below with a stout tooth; cubits clubbed at the apex; four anterior tibiae bent or bowed: hypopygium bidentate. [Belongs to the genus *Chrysobothris* Esch. Taken in Canada, and, according to Dr. Le Conte, in the following localities: "Lake Superior, Lake Winnipeg, Oregon and Washington Territories." He states that "the colour beneath is somewhat variable, and that he has a ♂ with the body entirely green, and a ♀ in which it is coppery, with purple spots at the sides of the abdomen. The sides of the thorax are sometimes straight, sometimes rounded, but it is never obviously wider in front."]

211. Buprestis (Odontomus) proxima *Kirby*.—Length of body 5½ lines. A single specimen taken in the Expedition.

[158.] Body minutely and thickly punctured: above black-bronzed obscure; underneath cupreous with the gloss obscured; except near the anus, cloathed with numerous rather long decumbent hoary hairs. Head somewhat cupreous, hoary from decumbent hairs; nose green, bilobed with divaricated lobes, including a somewhat obtusangular sinus; antennae green; vertex channelled: prothorax embossed in the disk, impressed and wrinkled at the sides; depressed parts punctured and reflecting a faint lustre of copper: scutellum an isosceles triangle, depressed and green at the base, elevated part black: elytra embossed, with a ridge extending from the apex where it is broader, by the side of the suture towards the base where it is abbreviated: the depressed spaces have a faint lustre of copper and bronze, and are thickly punctured; apex rounded and obsoletely serrulated: shoulders incrassated with a short robust tooth: all the tibiae are bent or bowed; cubit not dilated at the extremity: hypopygium with a deep sinus.

This nearly resembles *B. O. trinervia*, but is sufficiently distinguished by having only a single ridge on the elytra, and the posterior tibiae as well as the other pairs, bowed: the prothorax also is not channelled and its sides are rounded. [Belongs to *Chrysobothris*. Is not included in Le Conte's List.]

[159.] 212. Buprestis (Trachypteris) Drummondi *Kirby*.—Plate

ii., fig. 8, var. B.—Length of body 4¾ lines. Several specimens taken in Lat. 54° and 65°, and in the Rocky Mountains.

Body as it were reticulated with numerous punctures, bronzed, more obscurely on the upper surface, more glossy on the lower. Head very thickly punctured, obsoletely and slenderly channelled; apex of the nose levigated: prothorax transverse, with a double sinus in the basilar margin; obsoletely channelled, impressed on each side nearer the base, covered with innumerable scratches variously drawn, those of the disk being somewhat concentric; sides punctured: scutellum very minute, transverse: elytra very thickly punctured, and also exhibiting an appearance of granulations, slanting at the apex; the disk of the elytra, nearer the apex than the base, is marked with three yellow roundish dots arranged in an obtuse-angled triangle with the vertex towards the side; underside of the abdomen towards the anus less thickly punctured.

VARIETY B. Elytra with four yellow dots, a minute one, but varying in size, being placed outside the anterior one. [Belongs to *Melanophila* Esch. "Oregon and Washington Territories, abundant, straying into California and Alaska." (Le Conte).]

213. BUPRESTIS (TRACHYPTERIS) UMBELLATARUM *Fabr.*—Length of body 2¾ lines. Several specimens taken near Cumberland-house, Lat. 54°.

[160.] The description that Fabricius and Olivier have given of *B. umbellatarum* is so extremely brief, that I am by no means certain that the insect I here give under that name is really synonymous with it. As far as their description goes it corresponds, and also with Olivier's figure, but that is very indistinct. It has been found in Barbary, Portugal, and Provence. Fabricius says it affords no characters except its colour and smooth elytra; but it will be found upon a close inspection, I speak with regard to the American specimens, to exhibit several.

Body black-bronzed, covered all over as it were with a fine net-work, produced by minute lines as if scratched by a pin or needle; above dull, below glossy. Antennae much shorter than the prothorax: prothorax transverse with rounded sides, and longitudinal basilar impressions near each posterior angle: scutellum triangular: elytra with three very slight impressions arranged longitudinally; an obsolete series of punctures runs parallel with the lateral margin; apex obtuse and very minutely serrated: prosternum acuminate.

214. BUPRESTIS (OXYPTERIS) APPENDICULATA *Fabr.*—Length of body

4¾—5¼ lines. Several specimens in the Rocky Mountains, and near Cumberland-house.

[161.] Body black, not glossy. Head minutely and thickly punctured, channelled, on each side of the channel between the eyes is an impression; antennae nearly as long as the prothorax: prothorax scarcely wider than long, channelled, with a large but shallow impression on each side; sides thickly punctured so as to resemble net-work; rounded with the basilar angles depressed and a little diverging: scutellum nearly heart-shaped, acute: elytra rough with very minute and numerous granules, and several very slight shallow impressions, between which runs an obsolete obtuse ridge from the shoulder towards the apex, serrulated at the apex, and terminating in a very sharp point: breast minutely and thickly punctured; prosternum a little constricted in the middle, point triangular. [Though, as Le Conte remarks, this species here described is very closely related to the European insect to which it is referred by Kirby, it is Says' *Melanophila longipes*—a species not at all uncommon in Ontario, and taken also in such widely separated localities as Pennsylvania, Kansas and Lake Superior.]

215. AGRILUS BIVITTATUS *Kirby*.—Length of body 4 lines. Taken in Canada by Dr. Bigsby.

[Previously described as *Buprestis (Agrilus) bilineatus* Weber; for description *vide* Say's Ent. Works, i. 386 and ii. 596. This very pretty species is not uncommon in Canada, and is taken throughout the United States.]

[162.] 216. TRACHYS AURULENTA *Kirby*.—Length of body 3 lines. Taken in Canada by Dr. Bigsby.

Body obovate, black-blue, glossy. Sinus of the head deeper than in the other species; face nearly covered with glittering copper-coloured decumbent hairs; antennae shorter than the prothorax: prothorax transverse, repand on each side at the base with a central lobe, concave at the apex; anteriorly in the middle very convex; sides and base depressed; surface impunctured and tesselated with ruddy-copper hairs like those of the head: scutellum at the base transverse, with the vertex terminating in a long and sharp acumen: elytra with three ridges, the two inner ones less distinct, parallel, obtuse and abbreviated at each extremity, the external one distinct, acute running from the shoulder in an undulated line nearly to the apex of the elytrum; several rows of larger punctures are discernible, and several spaces thickly punctured with minute ones; the elytra are

also spotted with several hairy ruddy-copper spots, and ornamented with four or five undulated hairy indistinct silver bands: underneath the tint of blue is very faint and the disk of the breast is bronzed; the mesosternum is hollowed out into a deep channel. [Previously described as *Buprestis (Brachys) ovatea* Weber. Rather rare in Canada; taken in the Eastern, Middle and Southern States.]

MISCELLANEOUS NOTES

SMERINTHUS MODESTUS.—Several specimens of this very rare and beautiful sphinx have been captured in the neighbourhood of London during the past season.—W. S.

CAPTURES AT NORTH DOURO, CO. OF PETERBORO, ONT.—Having, in accordance with my invariable custom, taken notes during the past year of such entomological specimens as I have captured in this neighbourhood, I herewith furnish you with a list which, as the season for collecting has expired—save only with respect to those who search for insects in their *hibernacula*—may perhaps find some small vacant space upon the pages of our Magazine.

March 24.—A fine specimen of *Attacus Polyphemus* was hatched in a box in my library. In emerging from the cocoon, it made a noise similar to, and as loud as, that made by a mouse behind a wainscot. It was, in fact, by this scratching sound that my notice was first attracted to the box.

March 29.—I captured a "small tortoise-shell butterfly"—*Vanessa Milberti*. It was fluttering on the snow-covered ground, tempted abroad by a bright gleam of sunshine, the thermometer indicating, at the time, 30° Fahrenheit.

April 8.—I discovered, in a piece of decayed wood, a larva of a Fire-fly—*Photinus corruscus*. It emitted a very pretty pale-green light.

May 9.—Mosquitoes made their first appearance; all through this year they were less troublesome than I have ever known them previously.

May 21.—Swarms of Flea-beetles—*Haltica*—appeared on some cabbage plants growing in boxes. I watered the plants with tobacco-water, soon after which the beetles left them and gathered on the edges

and sides of the boxes, suffering, evidently, from *narcosis*. I killed hundreds of them, while in this condition, without difficulty.

I also, on the same day, poured tobacco-water into some ants' nests on my lawn, and the ants disappeared.

May 25.—Black-flies—*Simulia molesta*—put in their most unwelcome appearance, covering, positively darkening, trees and fences and sides of houses.

May 27.—*Papilio asterias*, *P. turnus* ♂ and ♀, *Vanessa antiopa*, and *Thyreus nesus*.

May 29.—*Chalcophora virginiensis*.

June 6.—Another specimen of *C. virginiensis* and *Chrysobothris femorata*.

Finding my currant and gooseberry-bushes infested with caterpillars, I watered them with hellebore and alum—1 oz. powdered hellebore and 2 oz. powdered alum, to a gallon of water—which I find an unfailing remedy.

June 9.—*Polyommatus Americana*.

June 10.—A friend brought me a "Cucumber-beetle"—*Diabrotica vittata*, with some of its eggs, which, with a look almost of triumph at the discovery, he assured me was a "Colorado Potato Bug." Nor could I convince him of his error until I showed him in my collection a specimen of the *Diabrotica* captured some years ago, long before the Colorado Beetle was heard of in Canada. I may here mention that on two subsequent days, two neighbours brought me specimens of the *Ancylochira fasciata* and the *Clytus speciosus* respectively, with the assertion, very emphatic in the case of the second, that they were the veritable much-dreaded "bugs."

However, on the 4th of the following month, July, I was shown, by another neighbour, some larvæ, discovered on a potato-patch in his garden, of the true *Doryphora 10-lineata*.

June 29.—"Locust-tree Carpenter-moth"—*Xyleutes Robiniæ*. *Limenitis arthemis* ♂.

July 1.—A "Buprestis"—*Ancylochira fasciata*.

July 3.—*Clytus speciosus*.

July 8.—"Common 3-striped Potato-beetle"—*Lema trilineata*. Three specimens.

July 25.—*Clytus speciosus*. *Hypercompa Lecontei*.

July 26.—The "Hellgrammite Fly"—*Corydalis cornutus.*

August 3.—*Dicerca lurida;* 8½ tenths of an inch long.

September 1.—*Chrysomela scalaris.*

September 11.—"Black-flies" made their *second* appearance: an unusual occurence. Several children were rather severely bitten by them.

It may not prove uninteresting to your readers if I superadd the following brief atmospheric notes:—

November 10.—First fall of snow. 16.—Sleighing. 28.—The river Otonabee, a rapid stream, frozen across from side to side. 30.—Thermometer 13° below zero—a somewhat extraordinary record for the month of November.—V. CLEMENTI, B.A.

"POLYHISTOR ?"—I cannot pass Mr. Couper's remarks on pp. 178—9, Vol. iii., unnoticed, though I have no quarrel with that gentleman. First, he takes too much unction to his soul in supposing that by qualifying too sweeping an assertion (see p. 158), I have in any way weakened the assertion that he mistook the above Lepidopterous larva for that of a Coleopter. I know positively that the *Balaninus* larva spins no web, while the *Holcocera* larva does. The first leaves the acorn to burrow in the ground, with rare exceptions, in the fall of the year; and any one who collects infested acorns on the last of March, as did Mr. Couper, will be morally certain to find 999 of them containing the *Holcocera* where one contains the *Balaninus.* Mr. Cooper's description on p. 65 also shows plainly that his larvae were moth-larvae, for in those of *Balaninus* the thorax is not "chestnut colour," and there are not numerous dots on the body. Feeling pretty sure that Mr. Couper had made a mistake, I drew attention to it for truth's sake, and if Mr. Couper writes for truth rather than victory, he will plainly tell the readers of the ENTOMOLOGIST, as he promised to do, whether or not he bred moths from those larvae which he obtained in March. Too much error creeps into entomological literature by careless description, and the settlement of the point in dispute between us is quite important. I have already stated that I know of no curculionidous larva in the United States that spins a cocoon. If Mr. Couper's larvae were really curculionidous, we shall have at least one exception; but I submit in all earnestness that no proof has yet been given.

With regard to the other strictures in his article on p. 178, I have little to say. I still claim that Mr. Couper should not use the term "Family" in the sense of "Order," as he did on p. 35; and whether Mr. Pettit, of

Grimsby, "comes to his aid," or not, in reference to the species of *Balaninus* infesting acorns, may be judged of by the following letter which Mr. Pettit wrote after reading my communication on the subject, as published in the October number :—

My Dear Sir,—Your letter in reference to the Acorn weevil was duly received, and I feel greatly indebted to you for it. I did not intend to refer the Acorn weevil to Say's *nasicus*, but supposed it to be known under that name, as it is the only one of the genus in our Canadian list. I was under the impression that Say's species were irrecognisable from the briefness of his descriptions, but after examining the few specimens in my collection under the light of your letter, I am convinced that you have given the true reading. Of eight captured specimens, all, with one exception, belong to *nasicus* as defined by you, and the six remaining specimens bred from acorns agree with your description of *rectus*. Two of these you will find enclosed herewith. Yours very truly, J. Pettit.

Grimsby, Oct. 17, 1871.

C. V. Riley, St. Louis, Mo.

ADVERTISEMENTS.

Notice.—The following scale for advertisements has been decided upon by the Editors :—

Whole page on cover or fly-sheet	.....	$5.00	per	annum.
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For body of the Magazine, the rates to be 5 cts. per line for first insertion, and 3 cts. for every subsequent one.

These rates are payable in advance.

Collecting Tour in Labrador.—When I penned the notice of my proposed tour to Labrador, I had no idea that there would be so much demand for Entomological material from this Northern quarter. But since the notice has appeared, letters have been received from Mr. P. S. Sprague, Boston Natural History Society ; Mr. Samuel Henshaw, Boston ; Mr. Geo. D. Smith, Boston, for *Coleoptera ;* and Dr. Theodore L. Mead, New York ; Mr. Herman Strecker, Reading, Pa. ; Mr. G. M. Levette, Assist. Geolog. Survey, Indianapolis, for *Lepidoptera ;* and having neglected to

give my full address, possibly other letters may have gone astray. I want only 12 subscribers for *Lepidoptera*, and the terms are settled by correspondence. I am anxious to put the *Coleoptera* into the hands of one person, or an institution, who could work and determine the material, in order to put the matter in some form for future reference. I will supply notes with every species collected.—WM. COUPER, 38 Bonaventure St., Montreal.

PLATYSAMIA COLUMBIA.—I will give in exchange for a good example of this moth one hundred specimens of *Lepidoptera* of various genera from California, Southern and Atlantic United States, S. America, Europe, East Indian Archipelago, &c., or double the number for two examples; or, if it is preferable, I will pay in money. HERMAN STRECKER, Box 111, Reading P. O., Berks Cy., Pa. U. S.

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. IV. LONDON, ONT., MARCH, 1872. No. 3

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from page 29.

It may be necessary to state that the names which I have used for the different nervures of the wings in these papers are those used by Dr. Clemens, and differ somewhat from those in use by European entomologists.

Various means may be used for the purpose of denuding the wings of their scales, so as to render the neuration distinct. The wing may be pressed slightly between two pieces of moistened bibulous paper, and the process repeated until the wing is sufficiently denuded; or, if this does not denude it sufficiently, the few remaining scales may be removed with a camel's or sable hair brush. M. Guenee moistens the paper with gum water. Soft wax may be used instead of the paper. Dr. Clemens' plan was to moisten a slip of glass, and then, placing the wing upon it, remove the scales with a moistened sable hair brush from one side, and then, turning it over, remove them in the same way from the other side.

But, with the greatest care and skill, there is danger of injuring the wings of the small moths, particularly of breaking off their tips, and especially if the wing is dry. And all of these plans require a great deal of time.

I have found the following plan preferable, as requiring less time and skill and being equally effective. Lay the wing upon a glass slip (e. g. a microscopic slide) covering it with a piece of thin covering glass (e. g. a thin glass cover for microscopic objects). Drop on the glass slip, so that it will flow under the slide, one or two drops of solution of potash or soda, and hold it over a lamp-flame until it begins to boil, removing it at the first ebullition. If boiled too long, the more delicate nervules may be obliterated, and if there is too much liquid, the wing may, by the boiling, become folded, so that it will be spoiled. The finer nervules may also be obliterated by allowing the wing to remain too long in the liquid. But if proper care has been taken in these respects, the glass slip may be removed from the lamp to the stage of the microscope, and the neuration

will be found very distinct, and may at once be accurately sketched under the camera. If it is desired to preserve the wing, it should immediately, by the cautious addition of clean water, be floated off the glass slip on to another clean slip, enough water being used to remove the potash, and the wing dried upon the slip.

This plan answers better still for the removal of the scales of the head and its appendages ; and the wing or head may be denuded and sketched under the camera within five minutes.

HYPONOMEUTA.

1. H. multipunctella Clem. *Proc. Acad. Nat. Sci., Phila., 1860, p. 8.*

Dr. Clemens' description of this species is too brief for a species belonging to a genus the species of which so closely resemble each other as they do in this genus. In a general way, his description characterizes almost any species of the genus.

He says : "Labial palpi, head, antennæ and thorax white. Thorax with a black spot on the front of the tegulæ, and a few spots of the same hue on the disk. Fore-wings white, with the costa at the base blackish, and longitudinal rows of distinct black dots, *two of which*, one along the inner margin, and one along the fold, are very plain. *Hind wings blackish grey.*" (The italics are my own).

What does "two of which" mean? two spots, or two rows of spots? If the latter, then it does not differ greatly from *H. euonymella.* But "hind wings blackish-grey" does not accord with either of the following species :

2. H. euonymella. N. sp.

Snowy white. Abdomen yellow ; posterior wings silvery white, fringed with snow-white. A black spot on the base of the tegulæ, six others on the thorax ; extreme costa black at the base ; forty to forty-five black spots on each wing, forming three rows, one on the costal margin, and one on each side of the fold, and a few scattered spots upon the disc. The spots in the costal row are smaller and wider apart than those in the two others, and are not so regular, as in some specimens they are a little out of line, and become intermixed with the discal spots ; the two other rows pass beyond the fold, and extend as a double row of small close spots around the apex till they meet the costal row. *The spots on each nearly circular. Alar ex.* ¾ inch. Kentucky. Very common.

The larva feeds upon the leaves of *Euonymus atropurpureus* in May, weaving together the edges of the leaves so as to enclose a space as large as a man's fist, which is filled with its loose web, and in which one, or

rarely two, larvæ may be found, though there are many such nests on the bush. The larvæ seem to take pleasure in letting themselves down by their threads about half way to the ground and swinging in the air. They are a little over one inch long, slender, greenish-white, with a darker green longitudinal line on the back, and about eight small black spots on each segment, except the second (the head being the first), which has only four or five. The spots are arranged in longitudinal lines. The pupa is green. Pupa May 28th. Imago June 6th.

3. *H. longimaculella. N. sp.*

White; posterior wings yellowish-white, fringed with white. There are two black annulations on the terminal joint of the palpi: one at its base, the other near the apex. Antennæ yellowish, faintly annulate with fuscous. A small black spot on the posterior margin of the vertex and anterior margin of the thorax, and about four distinct black spots on the posterior margin of the thorax, and a black spot on the base of the tegulæ. Extreme costa black at the base, a long black spot parallel with the fold, beginning at the base of the costa, and about sixteen other *oblong* black spots upon the wing, forming three or four irregular lines of spots, which sometimes seem to coalesce. Besides these spots, there are a few black scales scattered over the wing, and about twelve smaller spots extending around the apex at the base of the ciliæ. *Alar ex.* $\frac{3}{4}$ inch. Kentucky. Common.

Larva unknown. I took numerous specimens in the forest, June 4th. The spots, besides being oblong, are larger than in *H. euonymella*, which is the prettier insect of the two, though both are very pretty.

HERIBEIA? STEPHENS.

Stephen's generic descriptions are so general and vague, that one who has to rely upon them, without having seen authentic specimens, is driven to the necessity, in a good degree, of *guessing* at the genus to which a new species may belong. Of the two genera, to one of which the insect described below may belong, viz., *Lophonotus* and *Heribeia*, it seems to me that the latter is most probably the one in which it should be placed. "Palpi short, slightly elongate," is indefinite enough, and so is "hind wings *somewhat* linear triangular," and "more or less distinct, oblique, silvery-white, streaks or spots at the tip of the fore-wings," is not at all applicable to this species. Nevertheless, rather than encumber the science with a new name, which might be worse than useless, I have concluded to place it in *Heribeia*, with the following notes of its structural peculiarities:—

Tongue as long as the anterior coxæ. Maxillary palpi short and slender; labial palpi reaching, but not overarching, the vertex, simple, of *the same size from base to near the apex*, the terminal joint nearly as long as the first and second together; antennæ simple, more than half as long as the wings; scales of the head appressed or smooth. Anterior wings elongate ovate, *subfalcate beneath the tip;* discoidal cell rather wide, closed, the costal vein attains the margin just behind the middle, not far from the first sub-costo-marginal vein. The subcostal is straight from its base to the costa, just above the tip; the first marginal is given off just before the middle, the second not far behind it, and the third from about the end of the cell: *a short vein connects the second at about its middle, with the base of the third, thus forming a narrow elongate triangular cell, with its base resting on the subcostal near the end of the discal cell.* The discal (or transverse) vein gives off three branches to the hind margin, and below them the median is three-branched, the two terminal branches being much curved at base. Submedian distinct. Posterior wings a little wider than the anterior; costa rather straight, but decidedly retuse before the pointed tip; hind (or apical) margin not emarginate beneath the tip, but passing with a sweeping curve, like a cimeter, to the dorsal margin. Costal vein long and straight; subcostal long, straight, simple attaining the apex. Discal cell wide, closed by a transverse vein, which, near its middle, gives off a vein which bifurcates, sending one branch to the apex, and the other to the hinder margin; the median gives off three branches, one before the transverse vein, and the two terminal ones arising from a common stalk behind it. Submedian and internal veins distinct. The neuration of the forewings is thus scarcely different from that of *Hyponomeuta*, though the wing in this species is falcate, and the neuration of the hind wing is different.

H.? incertella. N. sp.

Palpi bronzy brown, second joint whitish on its inner surface. Head silvery. Antennæ brown. Thorax reddish or golden brown. Anterior wings greyish-brown, with indistinct spots and patches of darker brown, the largest of which is about the middle of the costal margin. A broad white streak about the basal fourth of the dorsal margin. Apical margin densely scaled; two hinder marginal dark brown lines in the ciliæ, one at their base, the other and wider one at their apex. *Alar ex.* nearly ½ inch. Kentucky.

ON THE EMBRYONIC LARVÆ OF BUTTERFLIES.

BY SAMUEL H. SCUDDER, BOSTON.

Reprinted from "The Entomologist's Monthly Magazine," Volume viii.

In their papers on various species of British *Macro-Lepidoptera*, Messrs. Hellins and Buckler furnish us with much better accounts of the external appearance of caterpillars than can be gained from the meagre and superficial descriptions which used to be thought sufficient; and, as they have not confined their descriptions to the full grown animals, but have followed the creatures through all their moults, they have, in several cases, incidentally shown how great a difference there is between the larva just hatched and the full grown caterpillar; especially in the case of some of the *Rhopalocera* thus treated by them. Mr. Riley, of America, has, in one or two instances, recorded similar facts.

It is the purpose of the present communication to point out the probable universality of this law—that caterpillars of butterflies present greater structural differences between the embryonic and adult stages of the same individual, than are to be found in the adult larvæ of allied genera. By the term "embryonic," I designate those caterpillars which have not changed their condition since leaving the egg, a stage in which they generally continue but one or two days. Some of the changes alluded to are more or less gradual in their appearance, but they generally occur at the first moulting of the caterpillar.

All the instances given are drawn from New England butterflies, and the generic terms employed are those used in my list, published in the Proceedings of the Boston Society of Natural History. If any one is sceptical in regard to the facts adduced, I can enter more into detail upon doubtful points. It should also be premised, that in studying caterpillars, the shape and sculpturing of the head, the form of certain segments, and especially the precise number, location and disposition of the spines, thorns, and hair-emitting warts of the body, will be found to furnish abundant means of distinguishing the most closely allied and minutely subdivided genera. But to our examples.

In the genus *Satyrus*, the body of the young larva is furnished with exceedingly long, scarcely tapering, compressed hairs, geniculate a little beyond the base, serrulate above, and generally directed backwards; those, however, which occur on the upper portion of the thoracic segments are directed forward, and thus present a very peculiar contrast. Nothing of

this sort appears on the mature larva, which is represented by Boisduval and Le Conte as quite smooth, but which is probably uniformly clothed with very short hairs.

In the genus *Hipparchia*, the young larva is born with a head of equal height and breadth, furnished with prominent lateral and frontal warts. The body has four pairs of longitudinal rows of tubercles definitely disposed, each tubercle bearing a short, straight, delicately clubbed bristle. The head of the mature larva, on the other hand, bears no lateral or frontal warts, but either half is prolonged upwards into a conical horn as long as the head itself; while the body is furnished only with microscopic hairs, irregularly distributed. In both this and *Satyrus* the bifurcation of the last segment of the mature larva, long known as a characteristic of the sub-family of *Satyrinæ*, is scarcely perceptible in the embryonic caterpillar, being indicated in *Satyrus* only by slight tubercles.

In *Limenitis*, the head of the young larva is smooth and equal, and the body uniform in size throughout, studded with numerous equal, stellate, regularly disposed warts. In the mature larva the head is covered with numerous conical warts, and surmounted by a pair of very large compound spinous tubercles. The body is by no means uniform, the second and third thoracic and eighth abdominal segments being "hunched" and tumid, while the first thoracic segment is much smaller than any of the others; the warts have changed to very variable tubercles—on the second thoracic segment into a long, club-like, spinous appendage—and are mounted on mammulæ of different sizes; the whole, aided by the strange coloration of the animal, presenting a most grotesque appearance.

In the young larva of *Grapta*, the head is smooth, and the body furnished with three pairs of rows of minute warts, each emitting a long tapering hair. In the mature larva, the head is crowned by a pair of long, stout, aculiferous spines; and the body bears seven longitudinal rows of mammiform elevations, each surmounted by a compound spine. That these spines are not simply the out-growth of the hairs of the immature caterpillar is evident from the fact that there is a median dorsal row which is entirely wanting at birth, and that the position of the other spines, relatively to the sides of the segments upon which they occur, is quite different from that of the hairs in the young animal.

The same statement, with generic modifications, may be made of *Vanessa* and *Pyrameis*.

In the genus *Argynnis*—or, rather, in that section which has been rightly separated from it under the name of *Brenthis*—the head of the

young larva is much broader than high, and the body profusely furnished with conical warts, arranged, to a certain extent, in clusters, which are in eight longitudinal rows, continuous on the thoracic and abdominal segments, each wart emitting a very long, tapering, spiculiferous hair, expanding into a delicate cup-shaped club at the tip. In the mature larva, the head is equally broad and high, and the body furnished with six longitudinal rows of simple, not clustered, mammulæ, differently disposed on the thoracic and abdominal segments, each mamula bearing a stout, fleshy, conical, bluntly tipped, aculiferous process.

In *Melitæa*, the head of the immature and adult larva scarcely differ. In the younger stages, the body is equal, excepting that the posterior half tapers slightly; in the older period it is also nearly equal, but tapers forward a little on the thoracic segments. Besides this, we find differences similar to, but even greater than, those referred to in *Grapta*. In the embryonic larva, the body is furnished with small warts, giving rise to rather short, tapering hairs, all arranged in five pairs of rows, three of them above, one on a line with, and one below, the spiracles. In the mature form, the hairs have given place to stout tapering spines, each supplied with many aculiferous, conical wartlets, and arranged in a median dorsal series and four pairs of lateral rows, two above and two below the spiracles.

If we next turn our attention to the *Lycænidæ*, we shall find similar differences. While the form of the head and body remain nearly the same from youth to maturity, the contrasts between the dorsal and lateral surfaces of the body are more pronounced in the early stage, both from the greater flattening of the upper field, and from the presence, at the line of demarcation between the two, of a series of warts, emitting hairs, some of which are exceedingly long, and curve backwards; similar hair-bearing warts are present along the fold dividing the lateral and the ventral regions, while there are one or more longitudinal rows of simple warts along the sides. The different groups, the *Theclæ*, *Lycænæ*, and *Chrysophani*, can be distinguished by the number of warts to a segment in each of the first-mentioned rows, and by the character of the hairs borne by them. In the full-grown larva, the linear series of warts are wanting, but the whole body is covered with microscopic hairs, seated, in *Lycæna*, on stellate dots, and which are only slightly, if at all, longer upon the angles of the body.

In the *Papilionidæ*, again, we find no differences of importance in the shape of the head, but some peculiar features in the armature and form of

the body. In *Colias*, the embryonic animal is furnished with four rows of peculiar appendages on either side of the body, three rows above the spiracles, each bearing one appendage to a segment, and one beneath them bearing two appendages to a segment; these appendages are short, fleshy papillæ, expanding from a slender base to a club-shaped apex, as broad at its tip as the entire length. In the mature larva, all this is wanting, but the body is profusely clothed with minute short hairs, seated on regularly-disposed delicate warts.

Pieris is similar; the young larva is furnished with long, hair-like appendages, tapering slightly, but at the tip expanding into a delicate club, and disposed much as in *Colias*. In the mature larva, the body is furnished with two sets of minute warts, one arranged in regular transverse series and hairless, the other irregularly distributed and emitting each a short delicate hair.

In *Papilio*, the body of the infantine caterpillar is invariably more or less angulated, like that of the young Lycænid; while, at maturity, it is always quite regularly rounded above the spiracles. It is furnished, when young, with several longitudinal rows of bristle-bearing tubercles, one tubercle to a segment in each row, one row in the middle of the side more conspicuous than the others. When full grown, the body is almost entirely naked in the species I have examined, being supplied only with smooth hairless, scarcely elevated, lenticular warts, or with irregularly distributed very minute wartlets, bearing inconspicuous hairs. In other species there are long, fleshy filaments upon the sides of the mature caterpillar, but I have not seen the embryonic stage. In addition, the first segment is supplied with an osmaterium, which is wanting in early life.

The *Hesperidæ* strongly remind us of the genus *Colias;* for we find the body of the embryonic larva supplied with rather short fungiform or infundibuliform appendages, disposed in rows upon the sides of the body, and arranged as in the *Pierinæ;* while in the full grown caterpillar, the body is furnished only with short downy hairs, irregularly and profusely scattered. This furnishes an additional proof, of which many others are not wanting, of the close affinity of the *Papilionidæ* and *Hesperidæ*.

We have thus passed in review most of the great groups of *Rhopalocera*,* and have substantiated, in a general way, the assertion made at the outset:—that there are greater structural differences between the embryonic and adult stages of the same individual than can be found in the

*Mr. Riley finds similar changes in *Danais*.—S. H. S.

adult larvæ of allied genera. Indeed, this statement is perhaps too feebly formulated, so important are many of the distinctions which have been traced. These differences, it should be noted, are not always in the same direction; for we have seen that caterpillars which in infancy are clothed with appendages of a unique and conspicuous character, definitely disposed, display, in mature life, irregularly distributed, scarcely perceptible warts, emitting simple and nearly microscopic hairs; while others, which in their earliest stage bore regular series of simple hairs, seated on little warts, become possessed, at maturity, of compound spines, surmounting mammulæ, also definitely arranged, but occupying a very different position to the hairs of early life. So, too, we find some caterpillars which bear a tuberculated, irregular head in infancy, and a smooth and equal one at maturity; or the reverse, where the head is simple at birth, and heavily spined or cornute when full grown; others, again, remain almost unchanged through life. This latter condition of uniformity never applies to the appendages of the body, whether we consider their character alone or their disposition. Nor—the only other possible condition—do we ever find larvæ bearing only irregularly distributed, simple, minute hairs in infancy, and regularly arranged special appendages at maturity. Indeed, it is doubtful whether such a phenomenon exists in Nature; since in the numerous and varied groups that have been examined, special dermal appendages have been found to be an invariable characteristic of embryonic larvæ.

August, 1871.

NOTES ON THE LARVA OF ACRONYCTA OCCIDENTALIS, *Grote.*

BY W. SAUNDERS, LONDON, ONT.

THIS insect in the imago state closely resembles A *psi*, of Europe, and has been, and we believe still is, doubtfully regarded as identical by several eminent European entomologists. We think, however, that a comparison of the larval forms of the two insects will help to dispel any doubts which may be entertained regarding the dissimilarity of the species. The following description of the larva of *occidentalis* has already appeared in part, in the Annual Report of the Entomological Society of Ontario to the Commissioner of Agriculture for 1870, where it is given,

and, as we supposed at the time, correctly so, under the name of *psi;* but since probably but few of our readers will have seen that Report, and as the edition is sometime since exhausted, we shall reproduce the description here in a fuller form :—

Larva sparingly hairy, found feeding on plum, cherry and apple.

Head rather long, bilobed, somewhat flat in front; black, with yellowish dots at the sides, and with a few scattered whitish hairs.

Body above bluish-gray, with a wide slate-coloured dorsal band, having a central pale orange line from second to fifth segments. From fifth to eleventh inclusive, each segment is ornamented with a beautiful group of spots, placed in the dorsal band, two of them bright orange—one in front and one behind—and one on each side of a greenish metallic hue; each group being set in a nearly circular patch of velvety black. There are two lateral cream-coloured stripes, the upper one adjoining the dorsal band, these stripes growing indistinct towards the anterior and posterior segments, and down which extends, from each of the black dorsal patches, a short black curved line, having immediately behind its junction with the dorsal band a yellowish dot. The sides are marked more or less with dull ochrey spots, some of which form a broken band, close to the under surface. On the dorsal portion of twelfth segment is a dull black spot, considerably raised, forming a small hump; terminal segment flattened and blackish. Body sparingly covered with whitish hairs, which are distributed chiefly along the sides, close to the under surface.

Under surface dull greenish, feet black.

Described from several specimens; found in the early part of September, entered the chrysalis state from the 15th to 20th September, and produced the imago from the 6th to the 8th of June following.

Mr. E. Newman, in his valuable work called "British Moths," gives a very full description of the larva of *psi* as follows:—"The head of the caterpillar is rather wider than the second segment; the body is hairy with parallel sides, but humped on the back; the first hump is slender, long, erect, horn-like, and seated on the fifth segment; the second hump is shorter, broader, and on the twelfth segment. The head is black, hairy, and shining; its divisions very convex; the second segment is black, with a very narrow median yellow line; the third, fourth, sixth, seventh, eighth, ninth, tenth and eleventh segments have a broad median yellow stripe, and there is a median square spot of the same colour on the hinder part of the twelfth segment; the horn-like hump on the fifth segment is

intensely black, and clothed with crowded short black hairs, intermixed with scattered long ones; on each side of the median stripe is an equally broad jet black stripe, and in this on every segment, from the fifth to the twelfth both inclusive, are two transverse bright red spots, with two minute whitish warts between each pair, the warts emitting black bristles; below the black stripe on each side is a broad gray stripe, emitting gray hairs, and including the black spiracles; this gray stripe is reddish on the anterior segments, the intensity of the red increasing towards the head. The belly, legs, and claspers are dingy flesh coloured. It feeds on white thorn, pear, and a variety of other trees."

The long, intensely black hump on the fifth segment, which is a very striking characteristic in *psi*, is entirely wanting in *occidentalis*, the coloration also is very different, the broad median yellow stripe, in the former from sixth to twelfth segments is also wanting in the latter. The circular black patches in the American species is represented in the European insect by a broad black stripe bordering the equally broad yellow one, the grouping and color of the clusters of small dorsal spots on each of these segments is also very different. In *psi* the black is bordered with a broad gray stripe becoming reddish on anterior segments, while in *occidentalis* the same portion is covered with two narrower cream colored stripes, becoming less distinct on the anterior segments. Many other minor points of difference might be educed, but these, we think, are sufficient to show that in the larval state these species are widely diverse.

The imago of *occidentalis* is said by Mr. Grote (see Proc. Ent. Soc. Phila., vol. 6, p. 16,) to differ from *psi*, "by the paler color of primaries, which are more sparsely covered with scales, and their somewhat squarer shape. The reniform spot on the disk shows a bright testaceous tinge, and the ordinary spots are less approximate than in *psi*. The secondaries are dark grey, nearly unicolorous, a little paler in the male, and darker in either sex than its European analogue."

After a careful comparison of a number of bred specimens with the European insect we fail to see the validity of most of the distinctive points urged by Mr. Grote. We have found the color of primaries to vary much, in some examples they have been darker, but in the majority they have been fully as light as those of *psi*; nor can we see any difference in uninjured specimens with regard to the density of the scale covering. In some the wings are somewhat squarer, but it is a difference scarcely perceptible, and in other examples we have failed to detect it. The testa-

ceous tinge in the reniform spot is perceptible in all the specimens we have seen, in some quite bright, but in others exceedingly faint. The relative approximation of the ordinary spots varies so much in different individuals as to be of little distinctive value. The darker color of secondaries is, we believe, more uniform, and is quite characteristic in most instances, but in several male specimens we have been unable to trace any difference in this respect. There are two other small points of distinction, not mentioned by Mr. Grote, which we have thus far found invariable: in *psi*, the orbicular spot has a black border on the outer side; in *occidentalis*, this is wanting, or scarcely perceptible, or otherwise replaced by a faint entire testaceous bordering. In *psi*, the inner black bordering of the reniform spot is double at its lower extremity, while in *occidentalis* we have never found it otherwise than single, and this much less distinct in most specimens. All these points of difference in the imago state, it must be admitted, are very slight and vague as compared with the striking dissimilarity of the insects in their respective larval forms.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 36.)

217. TRACHYS ACUDUCTA *Kirby*.—Length of body 4 lines. Taken by Capt. Hall in Nova Scotia.

[163.] Body oblong, punctured, hairy with scattered minute decumbent bristles resembling little scales, of a bronzed and glossy copper colour. Front with a slight sinus: prothorax transverse, trilobed at the base; disk longitudinally convex and naked; sides hairy; surface in the disk covered with minute transverse undulated lines curving upwards, and sides reticulated with them: scutellum transverse acuminated: elytra uneven, constricted before the middle, clouded and obsoletely banded towards the apex with minute whitish bristles; tips rounded, serrulate: prosternum broad, a little constricted in the middle, rounded at the apex.

[164.] FAMILY PYTHIDÆ.

218. PYTHO NIGER *Kirby*.—Plate vii., fig. 2.—Length of body 5¼—5½ lines. Several taken in Lat. 54°, and in the journey from New York to Cumberland-house.

[165.] Body linear, depressed, black, shining, punctured. Head with a longitudinal impression on each side between the eyes; nose smooth, flat, with the intermediate space less punctured; antennae and palpi dusky-rufous: prothorax conspicuously channelled, with the usual deep longitudinal impression on each side, lateral contour very convex, constricted posteriorly: elytra furrowed with elevated smooth interstices; furrows punctured and abbreviated at each end; base of the elytra, where the furrows cease, punctured: body underneath minutely punctured; abdomen piceous; tarsi rufous.

VARIETY B. Tibiæ also rufous: thighs piceous.

C. Body entirely ferruginous. It agrees with A in sculpture and every other respect except colour.

Many individuals of the present species were taken in the Expedition, all of them agreeing in having no tint of blue in the elytra; in having the levigated part of the base punctured, and the sides of the prothorax more prominent, than in *P. depressus*, from which it seems clearly distinct. [Included in the List of Canadian Coleoptera. Taken on the North Shore of Lake Superior by Agassiz's Expedition.]

219. PYTHO AMERICANUS *Kirby*.—Length of body 5—7 lines. Several taken in Lat. 54°, and in the journey from New York to Cumberland-house.

This species differs from the preceding chiefly in having the abdomen, medipectus, postpectus, legs and mouth rufous; in a slight punctured elevation on each side of the nose; the space between the eyes also is more distinctly punctured, and there are two deep impressions under the head between the eyes; the prothorax is widest anteriorly, and not constricted behind; and the elytra are deep blue, and scarcely punctured at the base.

It differs from *P. depressus*, in being wider in proportion to its length, and in having the abdomen, and two posterior sections of the breast, invariably rufous.

VARIETY B. Elytra rufous at the sides and tip.

C. Elytra entirely rufous.

D. Elytra entirely rufous; head and prothorax piceous.

E. Body entirely rufous. [Taken in various parts of Canada.]

[166.] FAMILY TROGOSITIDÆ.

220. TROGOSITA AMERICANA *Kirby*.—Length of body 5 lines. Two specimens taken in the journey between New York and Cumberland-house.

This species is the American representative of *T. caraboides* from which it principally differs in being larger, with the frontal impressions more distinct; the stalk of the antennæ much slenderer, and the knob thicker: the prothorax not so narrow and constricted at the base, and the elytra slightly furrowed. ["The description of this species is so imperfect that it cannot be identified "(Le Conte)].

[167.] FAMILY CERAMBYCIDÆ.

221. MONOCHAMUS RESUTOR *Kirby*.—Length of body 10¾ lines. Frequently taken in Lat. 65°.

[Synonymous with *Monohammus scutellatus* Say—a very abundant species in many parts of Canada. For description of this well-known insect, *vide* Say's Ent. Works, 1. 192.]

[168.] 222. MONOCHAMUS CONFUSOR *Kirby*.—Length of the body 1 inch and 1¾ lines. Taken in Nova Scotia by Dr. Mac Culloch, in Canada by Dr. Bigsby, in Massachusetts by Mr. Drake.

Body linear, elongate, black, covered with white or cinereous decumbent hairs, but so as to let the black appear in confused spots and reticulations. Labrum rather long, fringed anteriorly with ferruginous hairs; maxillary palpi long; rhinarium broad, rufous; antennæ testaceous with the redness obscured by decumbent cinerous hairs, but the scape and pedicel are black; the antennæ of the female are something longer than the body; those of the male are twice its length: the spines of the prothorax are stout, covered thickly with white hairs, and dotted posteriorly with black; in the disk is a central oblong impression: scutellum thickly covered with white decumbent hairs, with a black longitudinal line: the ground colour of the elytra is testaceous which is more or less obscured and clouded by white decumbent hairs, besides there are several black dots and oblong spots produced by erect hairs; at the base of the elytra, especially on the projecting shoulders, are numerous round elevated smooth little spaces, and their whole surface is covered with scattered minute punctures.

N. B.—In the male the black spots and dots of the elytra are fainter, and sometimes nearly obliterated. [The synonyms of this species are so much confused that Kirby's specific name may certainly be considered a most appropriate one, if it is allowed to stand. The insect here described is apparently identical with *Monohammus notatus* Drury, and *M. titillator* Harris; according to the rules of priority, it should, therefore, have the former name. It is a very common species in the pine forests of this country, especially in timber that has been left standing after a fire

has run through the woods. Specimens of this beetle are often found in recently built houses and about lumber-yards.]

[169.] 223. MONOCHAMUS MARMORATOR *Kirby*.—Length of body 11 lines. A single specimen taken in Lat. 54°.

Body black, covered underneath, but so that the black appears in various places, with subcinereous, or somewhat tawny decumbent hairs. Head and prothorax covered in the same way but with redder hairs: spines of the prothorax very robust, rather long, sharpish: scutellum covered with a coat of cinereous hairs, divided by a black longitudinal line: elytra black, marbled variously with cinereous and reddish tawny hairs; the cinereous spots are dotted with black; the surface of the elytra when laid bare appears punctured, and at the base are several confluent smooth elevated spaces; suture and lateral margin testaceous; apex acute.

N. B.—The antennæ in the specimen are broken off. [Unknown to us.]

224. ACANTHOCINUS (GRAPHISURUS) PUSILLUS *Kirby*.—Length of body 4¼ lines. A single specimen taken in the journey from New York to Cumberland-house.

[170.] This species is one of the most minute of the Capricorn tribes. Body linear, black but covered with a coat of whitish decumbent hairs, which appears more or less sprinkled with black dots. Head longitudinally channelled; antennæ mutilated in the specimen, but those joints that remain are white at the base: prothorax short, armed on each side, towards the base with a short sharp spine, punctured with scattered punctures; elytra punctured especially towards the base, mottled and speckled with brown, with an oblique brown band a little beyond the middle, apex of the elytra rounded: podex and hypopygium, or last dorsal and ventral segments of the abdomen elongated, so as to defend the base of the ovipositor which is exserted, causing the insect to appear as if it had a tail; the hypopygium is emarginate: thighs much incrassated at the apex. [Not common; taken at Grimsby by Mr. Pettit, and on oak-trees in the neighbourhood of Philadelphia by Mr. Bland.]

225. CALLIDIUM AGRESTE *Kirby*.—Length of body 11 lines. Several specimens taken in the Expedition, and likewise in Nova Scotia by Dr. Mac Culloch and Capt. Hall.

I at first took this for a variety of *C. rusticum*, but on a closer inspection I found it differed in the sculpture as well as colour; and having

received a specimen of that insect from Dr. Harris, in which its characters were all preserved, I am induced to describe *C. agreste* as a distinct species.

It differs from *C. rusticum* in being smaller, of a darker brown, without a tint of red; and in having more gloss. The prothorax has three deep round impressions, while in the insect last named, the impressions are slight, and the two anterior ones oblong: the elevated lines of the elytra are more prominent and become visibly confluent towards the apex, where they form several reticulations: the underside of the body is much more thickly covered with hairs, which are hoary instead of yellowish, those on the breast being longer than those on the abdomen. In other respcts these two insects resemble each other. [Included in the genus *Criocephalus* Muls. Taken throughout Ontario and at Lake Superior.]

[171.] 226. CALLIDIUM STRIATUM *Linn.*—Length of body 5¼ lines. A single specimen taken in Lat. 65°.

Body linear, black, thickly punctured, underneath with a few hairs, glossy; above without any hairs or gloss. Antennæ a little longer than the prothorax: prothorax suborbicular, covered thickly with minute granules, with an elevated tubercle in its disk: elytra most minutely and thickly granulated, with four longitudinal slight furrows occupying the half adjoining the suture, the alternate interstices being most elevated: tarsi rufo-piceous. [Synonymous with *Asemum mœstum* Hald. Taken throughout Ontario.]

227. CALLIDIUM COLLARE *Kirby.*—Length of body 5 lines. A single specimen taken in Lat. 54°.

Body linear, black, hairy with whitish scattered hairs. Head thickly punctured; antennæ shorter than the body, rather hairy, piceous, scape black: prothorax rufous, with a few scattered punctures, glossy, projecting on each side into an angle or short spine: elytra very thickly and confluently punctured: body underneath glossy, slightly punctured: anterior part of antepectus rufous: tarsi piceous, first joint of nearly equal length in all the legs. [North Shore of Lake Superior, Agassiz's Expedition.]

[172.] 228. CALLIDIUM PROTEUS *Kirby.*—Plate v., fig. 5.—Length of body 5—8½ lines. Taken abundantly especially in Lat. 65°.

Body black, minutely punctured, hairy with longish hoary hairs, especially underneath. Nose with a deeply ploughed transverse furrow; front behind the antennæ violet, confluently punctured; palpi black, maxillary rather long, last joint an obtusangular triangle; antennæ longer than the

prothorax; sides of the prothorax very rough with deep confluent punctures: elytra wrinkled, violet, with three longitudinal, subinterrupted, callous, pale lines, of which the intermediate one is the longest, and the external one the shortest: legs piceous, with the incrassated part of the thighs testaceous.

This species varies extremely both in size and colour. The following are the principal varieties:—

VARIETY B. Head and prothorax violet; elytra lurid with only two callous lines. Length 6¼ lines.

C. Head, except at the base of the antennæ, black; sides of the prothorax violet, disk bronzed: elytra as in the last. Length 5 lines.

D. Head and prothorax black; elytra lurid; lines faintly marked. Length 5⅓—7 lines.

E. Head and prothorax bronzed: elytra lurid bronzed, with two distinct lines. Length 6—7 lines.

F. Head violet; prothorax bronzed: elytra as in the last. Length 6 lines.

G. Like the last, but the callous lines of the elytra are obsolete. Length 5½—6½ lines.

H. Head and prothorax black: elytra lurid with three lines. Length 7½ lines.

I. Head and prothorax black-bronzed: elytra bronzed-lurid with two lines.

MEETINGS OF THE LONDON BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

THE Annual Meeting of the London Branch was held on Friday evening, January 5th, at the residence of Mr. W. Saunders. In addition to a goodly attendance of London members, we were favoured with the presence of the esteemed President of the Parent Society, Rev. C. J. S. Bethune, M.A. The following officers were elected for 1872:—

PRESIDENT.....MR. E. B. REED.
VICE-PRESIDENT.....MR. J. M. DENTON.
SEC.-TREASURER.....MR. W. SAUNDERS.
CURATOR.....MR. JOSEPH WILLIAMS.

The Annual Report of the Secretary-Treasurer was read, showing a

healthy condition of the finances of the Branch, all the current expenses of the year having been met, and a small balance still on hand.

Mr. Reed introduced the subject of local collections, and urged their importance. After some discussion, the following resolution was passed:

"That a local collection of insects shall be made for the Cabinet of the Branch, specimens to be collected within walking distance of the city, and that we, the members, will do all in our power to specially aid and assist in this collection."

FEBRUARY, 1872.

The regular monthly meeting was held on Friday evening, February 2nd, at the residence of Mr. J. M. Denton.

After the routine business was over, a letter was read from Mr. Billings, thanking the members of the London Branch for their kind resolution of sympathy in reference to his father's death, the late B. Billings, of Ottawa.

The excellent microscopes belonging to Messrs. Puddicombe and Denton were then turned to good account by the members, who examined with the aid of high magnifying powers, many objects of great interest.

NOTICE TO MEMBERS.

We regret to state that the Secretary-Treasurer, Mr. E. B. Reed, has been laid up for some little time with an attack of pneumonia, which will probably confine him to his house for a few days longer. He requests us to state that he has received *letters* from C. J. Beale, G. M. Levette, V. T. Chambers, J. W. Byrkitt, R. V. Rogers, J. A. Lintner; and *remittances* from W. V. Andrews, G. Dimmock, H. Y. Hind, H. S. Sprague, J. Bain, O. S. Westcott, Rev. L. Provancher, H. K. Morrison.

The Secretary craves the indulgence of these gentlemen until his health will permit him to reply to their letters.

WILLIAM SAUNDERS,

London, March 15, 1872. *Associate Editor.*

MISCELLANEOUS NOTES

APPROPRIATIONS FOR ENTOMOLOGICAL PURPOSES IN THE STATES.—At the late National Agricultural Convention held in Washington, Mr.

Chas. V. Riley introduced resolutions, which were unanimously passed, asking, in the first place, for an appropriation of $25,000 to enable the Entomologist of the Department to finish the work on which he has been engaged for so many years; and, in the second place, for an annual appropriation of not less than $10,000 for experiments in destroying noxious insects.

The last appropriation is to enable such States as may be suffering from the injuries of any insect to an alarming extent, to make the proper investigations and experiments towards abating such injuries. The fund is to be at the disposal of the Commissioner of Agriculture, who upon application from any of the State Boards of the different States, may authorize the expenditure of whatever amount he sees fit, for the purposes mentioned.

Entomological Report.—The Report of the Entomological Society of Ontario is expected to be issued this month. Great delay has been experienced owing to the pressure of Parliamentary printing required for the Session of the Legislative Assembly, which has just closed.

ADVERTISEMENTS.

Notice.—The following scale for advertisements has been decided upon by the Editors:—

Whole page on cover or fly-sheet	.....	$5.00 per annum.
Half " " " "	.....	3.00 " "
Quarter " " " "	.....	1.50 " "

For body of the Magazine, the rates to be 5 cts. per line for first insertion, and 3 cts. for every subsequent one.

These rates are payable in advance.

Collecting Tour in Labrador.—When I penned the notice of my proposed tour to Labrador, I had no idea that there would be so much demand for Entomological material from this Northern quarter. But since the notice has appeared, letters have been received from Mr. P. S. Sprague, Boston Natural History Society; Mr. Samuel Henshaw, Boston; Mr. Geo. D. Smith, Boston, for *Coleoptera;* and Dr. Theodore L. Mead, New York; Mr. Herman Strecker, Reading, Pa.; Mr. G. M. Levette, Assist. Geolog. Survey, Indianapolis, for *Lepidoptera*, and having neglected to

give my full address, possibly other letters may have gone astray. I want only 12 subscribers for *Lepidoptera*, and the terms are settled by correspondence. I am anxious to put the *Coleoptera* into the hands of one person, or an institution, who could work and determine the material, in order to put the matter in some form for future reference. I will supply notes with every species collected.—WM. COUPER, 38 Bonaventure St., Montreal.

PLATYSAMIA COLUMBIA.—I will give in exchange for a good example of this moth one hundred specimens of *Lepidoptera* of various genera from California, Southern and Atlantic United States, S. America, Europe, East Indian Archipelago, &c., or double the number for two examples; or, if it is preferable, I will pay in money. HERMAN STRECKER, Box 111, Reading P. O., Berks Cy., Pa. U. S.

CORK.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot.

PINS.—We have still a supply of Nos. 3, 5 and 6 left. A large quantity have been ordered, and are shortly expected. The prices in future will be slightly raised. The present stock will be sold at 75c. (gold) per packet of 500.

CANADIAN ENTOMOLOGIST, Vols. 1. 2 and 3.—We have a few copies left of Vols. 1 and 2, No. 1, of Vol. 1, being, however, out of print. Price $1.25 for Vols. 1 and 2; $1 Vol. 3.

LIST OF CANADIAN COLEOPTERA.—Price 15 cents each, embracing 55 families, 432 genera, and 1231 species. (For labelling cabinets).

PRINTED NUMBERS, in sheets, 1 to 2000, for labelling cabinets. Price 10 cents each set.

These prices are exclusive of cost of transportation, and orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. IV. LONDON, ONT., APRIL, 1872. No. 4

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 2.

Continued from Page 24.

BY E. T. CRESSON, PHILADELPHIA.

Family ICHNEUMONIDÆ.

Genus PEZOMACHUS, Grav.

1. PEZOMACHUS PETTITII. *N. sp.*—♀.—Head piceous-black, face rufo-piceous, the middle longitudinally prominent; mandibles fuscous; antennæ longer than head and thorax, pale ferruginous, dusky at tips; thorax nearly as long as abdomen, piceous-brown, paler laterally and beneath, nodes subequal; legs entirely piceous-brown; abdomen ovate beyond first segment, shining piceous-black; first segment narrow, slightly dilated behind the lateral tubercles which are not prominent, apical margin pale; sometimes the head, thorax and abdomen are entirely piceous-black, except the pale band at apex of first segment which is always conspicuous in this species; ovipositor short, about as long as first abdominal segment. Length .14—.15 inch.

Hab.—Ontario, Canada. Two specimens received from Johnson Pettit, Esq., of Grimsby, after whom this easily recognized species is named.

2. PEZOMACHUS GENTILIS. *N. sp.*—♀.—Head entirely black; antennæ longer than head and thorax, pale ferruginous, fuscous at tips, and dark at incisures of joints; thorax nearly as long as abdomen, anterior node ferruginous, larger than posterior one which is convex and black; legs honey-yellow, tibiæ and tarsi yellowish; abdomen fuscous, ovate beyond first segment which is pale at base, and scarcely dilated behind the prominent lateral tubercles; basal and apical margins of second segment faintly pale; ovipositor rather longer than first abdominal segment. Length .12 inch.

♂.—Black; antennæ blackish, ferruginous at base; prothorax, legs and first abdominal segment ferruginous or honey-yellow; second, third and most of fourth segments pale honey-yellow, apical segment black; wings ample, hyaline, iridescent, with a faint cloud beneath stigma, which

honey-yellow, shining, not nodose; metathorax rather larger than pro. and mesothorax, convex and somewhat prominent posteriorly; legs honey-yellow, the femora more or less fuscous; abdomen ovate, first two segments pale honey-yellow, remainder black, with a slight iridescent reflection; first segment broadly dilated at apex; ovipositor longer than first and second abdominal segments. Length .13 inch.

Hab.—Ontario, Canada. (Saunders). Three specimens. A very pretty, and easily recognized species.

7. PEZOMACHUS COMPACTUS. *N. sp.*—♀.—Short, compact, robust, bright honey-yellow; antennæ with short compact joints, apex slightly dusky: thorax short, nodose, posterior node shortest, and transversely subcompressed; legs more robust than usual; abdomen subglobose, the third and following segments black, the first segment considerably dilated at apex; ovipositor very short. Length .12 inch.

Hab.—Illinois. A very distinct species from its compact robust form, and is distinguished at once from *canadensis* by the head being concolorous with the thorax.

8. PEZOMACHUS DIMIDIATUS. *N. sp.*—♀.—Honey-yellow, more or less tinged with rufous; antennæ long, slender, yellowish beneath, dusky above; nodes of thorax subequal, the anterior one with a medial longitudinal groove; legs concolorous with thorax, tips of coxæ, trochanters and knees yellowish, posterior tibiæ dusky at tips; abdomen ovate beyond first segment, convex, shining; first and second segments dull honey-yellow, apex of second yellowish, third and remaining segments dark brown or rufo-piceous, sometimes the third segment is pale brown; first segment rather suddenly dilated behind middle; ovipositor about one-third the length of abdomen. Length .17 inch.

Hab.—Massachusetts; Illinois. Two specimens.

9. PEZOMACHUS GRACILIS. *N. sp.*—♀.—Honey-yellow, more or less tinged with rufous; antennæ long, slender, yellowish throughout; thorax as in *dimidiatus*, except that the anterior node has no median sulcus; legs long and slender, entirely yellowish; abdomen shaped as in *dimidiatus*, except that the first segment is more gradually and less dilated at apex, honey-yellow and yellowish at tip; second segment fuscous, with apical margin yellowish; third and fourth segments fuscous, sometimes the apical margin of the latter faintly yellowish; apical segments dull yellowish; ovipositor longer than first abdominal segment. Length .20 inch.

Hab.—Pennsylvania. Two specimens.

10. PEZOMACHUS MACER. *N. sp.*—♂.—Long, narrow, apterous; head yellowish-brown, clypeus paler, vertex dusky; antennæ as long as body. slender, dusky, scape pale yellowish; thorax long, yellowish-brown, blackish on posterior portion of the nodes which are subequal; tegulæ whitish; wings wanting; legs long, slender, dull yellowish, posterior pair dusky; abdomen long, linear, black, the first and apical margin of second segment yellowish. Length .20 inch.

Hab.—Pennsylvania. This may be the ♂ of *gracilis* or *dimidiatas.*

11. PEZOMACHUS ALTERNATUS. *N. sp.*—♀.—Dull honey-yellow or pale rufous; antennæ yellowish, with the joints shorter than usual; thoracic nodes subequal, convex above, prothorax tinged with yellowish; tips of posterior tibiæ slightly dusky; abdomen ovate, convex, polished; first segment honey-yellow, rapidly dilated to apex which is pale, remaining segments brown or piceous on basal half, shading into yellow at apex; ovipositor very short. Length .18 inch.

Hab.—Illinois. More robust than *gracilis* which it resembles; the antennal joints are, however, shorter, and the anterior node of thorax more convex.

12. PEZOMACHUS TEXANUS. *N. sp.*—♀.—Long, slender, pale honey-yellow; head large, vertex dusky; antennæ longer than head and thorax. the joints beyond middle with dusky incisures; thoracic nodes subequal and convex; abdomen ovate beyond first segment, convex, base of second and third segments more or less fuscous; first segment unusually long and slender, and scarcely dilated at apex; ovipositor nearly as long as first abdominal segment. Length .15 inch.

Hab.—Texas. (Belfrage). Very distinct by the long and slender first abdominal segment.

PEZOMACHUS UNICOLOR. *N. sp.*—♀.—Entirely pale ferruginous, shining; antennæ dusky at tips; thoracic nodes subequal, convex; abdomen ovate beyond first segment, which is gradually dilated to apex; ovipositor as long as abdomen, sometimes longer, pale honey-yellow, sheaths black. Length .16—.18 inch.

Hab.—Massachusetts; Delaware; Illinois. Four specimens.

CATERPILLARS IN BELGIUM.—The Provincial Council of Brabant have published a decree to the effect that as the regular annual destruction of caterpillars and other insects, which takes place in February, has not been found to clear the land of these pests, all owners and occupiers of land are enjoined to clear their trees, shrubs, hedges and bushes of caterpillars during the month of November, as better results are anticipated.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from page 44.

HOLCOCERA, *Clemens.*

This genus approaches *Gelechia*, but not so nearly as *Anarsia*, *Parasia*, &c., the hind wings being sublanceolate, and not emarginate beneath the apex, and having a different neuration. Dr. Clemens describes four species, only one of which, *H. chalcofrontella*, is known to me. *Gelechia glandulella*, Riley, belongs here. The genus is divisible into two branches.

A. In which the median vein of the hind wings *gives off one branch before the transverse vein and a furcate branch behind it*, and the curved apical branch.

1. *H. chalcofrontella*, Clem. *Proc. Ent. Soc. Phila., 1863, p. 122.*

The other three species described by Clemens most likely belong to this section, as he mentions no other form of neuration.

B. In which the median *gives off two veins before the transverse one, and one*, besides the apical, *behind it* (as if the furcate vein of section A had been divided, and one branch transferred before the transverse vein).

2. *Gelechia (Holcocera) glandulella*, Riley, *ante Vol. 3, p. 118.*

ANARSIA.

A. Obiqui-strigella. N. sp.

Palpi with the second joint dark brown beneath; white above and at the tip. Third joint dark brown, with a white annulus at the base, and another about the middle. Face white. Antennæ with the basal joint white, stalk annulate alternately, with dark, greyish-brown and white. Thorax and wings white, thickly dusted with pale grey-brown. A dorsal brown streak, near the base, points obliquely backwards towards a small costal brown spot, and reaches more than half across the wing. An oblong, costal, dark brown spot about the apical fourth of the wing, a discal, oblong streak opposite the space between the costal spots, and another small one near the beginning of the ciliæ, and another large one in the apical portion touching the costal margin near the apex. Sometimes these discal and apical streaks are continuous, forming a streak from the middle of the wing to the apex.

Alar ex. ⅜ inch. Larva unknown. Kentucky. The terminal joint of the palpi in this species is not roughened, but the proportions of the

joints, and the neuration of the wings, and opaque spot on the costa, are those of *Anarsia.*

EVAGORA.

E. difficilisella. N. sp.

Palpi and antennæ dark brown; tip of the second joint of the palpi, and two annulations on the terminal one, white. Head, thorax and anterior wings, hairy. A minute dark brown spot (wanting in many specimens) at the base, just within the dorsal margin. A large, bronzy, dark brown spot, with purplish reflections, on the base of the costa, a small one about the basal one-fourth, another larger about the middle of the costal margin, a small one at the beginning of the dorsal ciliæ, one, two or three on the disc, a larger, somewhat scattered, patch in the apical portion, and a row of about eight around the apical margin. Ciliæ pale fuscous, dusted with hoary scales. The costal and one discal spot margined with yellowish. *Alar ex.* ⅜ inch. Kentucky. Common.

PARASIA.

The preceding genus scarcely differs, generically, from this. Indeed, so little, that I doubt greatly the propriety of their separation, the only differences in the imago being slight ones in the neuration of the wings.

P. apici-strigella. N. sp.

Silvery, suffused with pale yellowish; apex of the forewings deeply suffused with reddish-ochreous, and finely sprinkled with white (each scale tipped with white.) There is a very oblique short white streak about the middle of the costa, dark margined on both sides; behind it, at the beginning of the ciliæ, is a long narrow unmargined white streak, passing obliquely to the middle of the apical part of the wing, where it almost meets an opposite dorsal obliquely curved long white streak; behind the costal streak are three short straight white costal streaks, the last of which is nearly opposite to a small straight white dorsal streak, which forms the internal margin of a dark brown dorso-apical spot. Ciliæ composed of three rows of reddish ochreous scales, each tipped with white, forming three wide reddish ochreous bands, separated by three narrow white lines. *Alar ex.* nearly ½ inch. Kentucky.

This is evidently very near *P. apici-punctella*, Clem.

GELECHIA.

This huge genus comprehends a somewhat heterogeneous assemblage of small moths having a certain general resemblance, but differing from each other considerably in size, in the neuration of the wings, and the

amount of the excision of the hind wings, and the size and shape of the labial palpi, and yet more in the habits of the larvæ.

In the living insect the wings are deflexed in repose, thus differing from *Depressaria*, and some other allied genera. In many species, the posterior margin of the hind wings is deeply excised beneath the costa; in others, the emargination is small or none. The antennæ are slender and simple, and usually about three-fourths as long as the wings. The maxillary palpi are microscopic, whilst the labial are long, overarching the vertex, with the third joint pointed, and about two-thirds as long as the second, which is enlarged, though not brush-like beneath.

It is, perhaps, the largest genus among the Micros, and, widely as some of the species differ from each other, it has not yet been found practicable to effect a natural division of it. The habits of the larvæ are very diverse, some of them being leaf miners, some making galls in stems of plants, some feeding inside of nuts and fruits, while others are external feeders. There is no "pattern of coloration" peculiar to this genus, the species of which are of all shades and colours. It is a genus of very wide distribution, and some of the species are common, now at least (whatever they may have once been), to both continents, and to many regions in both.

1. *Gelechia Hermannella*, Stainton. *Nat. Hist. Tin., v. 9, p. 262.*

This unique and handsome species is described, and the synonymy given, by Stainton, with a good figure (fig. 3, plate 8). The longitudinal silvery streaks are, however, a little more elongated in the figure than in my specimens, so as to connect the transverse markings. It occurs almost all over Europe, but has not heretofore been recorded from this country. I have found it mining the leaves of species of *Chenopodium* in Kentucky and Wisconsin. The larva, at first, is white; but, towards maturity, *eight* crimson spots make their appearance on each segment; four on top and two on each side. (Stainton says four, but in all of my specimens there are eight). Sometimes some of the spots are confluent. It enters the leaf from the upper surface, and frequently leaves an old mine to construct a new one. Frequently the leaves are scarred or blotched by numerous mines, and sometimes the whole leaf is mined, but in such cases there are several larvæ in a mine. The typical form of the mine seems to begin as a point, from which it passes, gradually widening, first to one side, then to the other, in a series of loops, each extending a little farther than the preceding, like a band gradually widening, wound around a cone. The frass is scattered through the mine.

I quote Mr. Stainton's description :—

Alar ex. 4 to 4½ lines. Head and face (and thorax) dark bronzy grey (with purplish reflections). Antennæ blackish. Anterior wings bright reddish-orange, with the base black (the black being externally margined with silvery on the costa), a short oblique streak from the costa near the base, and a small spot near the inner margin, are silvery ; before the middle, is a slender, slightly oblique, silvery fascia (interrupted by the fold), margined with black, and followed by a black blotch on the costa ; beyond it are three short longitudinal silvery streaks, one on the costa, one on the disc, and one, much shorter, on the fold. On the costa, before the apex, is a short (? it can hardly be called short, either in Mr. Stainton's figure or in my specimens) silvery streak pointing inwards, and on the inner margin at, the anal angle, is a small silvery spot ; these appear to represent the usual subapical spots ; a few silvery scales lie towards the middle of the hind margin, which is otherwise black. (In my specimens there are, on the dorso-apical margin, instead of these markings two distinct silvery spots separated by a small blackish spot) ; ciliae blackish. Posterior wings dark greyish fuscus, with the ciliae rather paler.

The portions above included in brackets are interpolations by me.

2. *G. tephriasella. N. sp.*

Palpi with the second joint dark brown, tipped with white, third joint brown, dusted with white, and with a white annulus before the tip. Head pale whitish-grey, each scale tipped with white. Antennae with alternate annulations of grey and white, with five or six very distinct white ones, more widely separated towards the apex. Fore wings and thorax pale grey, about equally intermixed with white, becoming gradually darker grey and fuscous towards the tip, each of the darker scales tipped with white. There is a small, very oblique white streak or spot on the costa, just behind the middle, and at the beginning of the costal ciliae the wing is crossed by a narrow white fascia. An indistinct fuscous hinder marginal line or row of spots at the base of the ciliae, which are of the general hue.

Alar ex. about ⅜ inch. Kentucky. Larva unknown. Having but a single specimen, I have not examined the neuration of the wings, but I think it is a true *Gelechia* probably allied to *G. rhoifructella*, Clem.

3. *G. palpiannulella. N. sp.*

Shining bronzy dark brown ; there is a whitish ring around the end of the second palpal joint, and another around the middle of the third one, and a small, very pale, yellowish costal spot just before the ciliae, and an

opposite dorsal one, and one within the dorsal margin about the middle. Posterior wings yellowish-brown. *Alar ex.* ⅜ inch. Kentucky. Common. Larva and food plant unknown. Captured in July to September. The neuration differs a little from that of *G. roseosuffusella*. Possibly this may be *G. mimella*, Clem., which it seems to resemble closely. But Clemens says there is an "ochreous band near the tip," instead of the opposite costal and dorsal spot of this species ; and he speaks of a few dark brown spots upon the costa and in the apical portion of the wing, which I can not discover in this species, and he describes it as tawny brown. I think this is a true *Gelechia*.

It must bear considerable resemblance to the European *G. Anthyllidella*, figured by Stainton.

4. *G. roseosuffusella*, Clem. *Proc. Acad. Nat. Sci., Phila., 1860, p. 162.*

This is our commonest species. There is great difference in the extent and intensity of the roseate hue of the wings. In some specimens it is scarcely perceptible, in others it is very distinct, and spreads over the greater portion of the wing. *Alar ex.* ⅞ inch.

ERRATA.—V. 3., p. 206, for *L. vitifoliella* read *P. vitifoliella*, and for *P. ampelopsifoliella* read *P. ampelopsiella*. P. 222, for "*cephalonthiella*" read *cephalanthiella*.

V. 4., p. 10, for "*powdered*," in line 9 from the bottom, read *produced*, and p. 12, at the end of the 1st line, for "there" read *thus*.

ON A NEW CHECKERED HESPERIA.

BY AUG. R. GROTE, DEMOPOLIS, ALABAMA.

A common species of *Hesperia* in central Alabama, and that I do not find described by authors, is one that I call *Syricthus communis*. It is plentiful from early spring to autumn, and must be several brooded, but I have not found the larva.

The male is a little smaller, and the white checkered spots are altogether larger and more numerous, than in the female. The ground colour of the wings is a brownish black, and longer bluish white hair spreads from the base of the forewings over the inferior portion of the primaries, and from the base of the hind wings downwardly without touching the abdominal margin. A more prominent median band of white spots, three

in number, below the median vein, divided by the sub-median nervure and fold, and surmounted by one on the disc larger within the three. Clustered minute linear dots between the sub-costal veinlets at the base, and below them three larger, divided by the discal fold and median vein opposite the cell. A series of subterminal white dots, the three lower the larger. Terminal minute interspaceal dots; fringes white, interrupted. Costal edge white, dotted externally. Secondaries with a broader series of mesial spots, reduced in size inferiorly, a subterminal and a minute terminal series of white spots and dots; fringes white, less interrupted than on primaries. Beneath, the secondaries are whitish, with four series of olivaceous, darkly margined, incomplete and irregular bands. A black subtriangular shaded spot at anal angle. Body whitish beneath, above blackish with longer bluish or greenish hair; abdomen obsoletely annulate. The fringes of the female primary are dusky.

Expanse—♂ 28; ♀ 30 m.m.

OBITUARY.

By the recent death of Mr. BRADDISH BILLINGS, of Ottawa, Canada has lost one of her most devoted and enthusiastic sons of science. It has been remarked that the lives of men engaged in scientific enquiries are usually devoid of much interest. The pursuits they follow are not unfrequently above the comprehension, and, consequently, the sympathy of the busy active world. The strife of political partizanship, which engrosses so deeply most minds, has to them little, if any, attraction. Their tastes and habits of thought lead them into other and more congenial fields. The honor or distinction that accrues to them from the successful prosecution of their scientific labors is all they desire. They shun the din and glare of the paths that are generally supposed to lead to fame, content if allowed to pursue their cherished schemes; and hence, when they die, the record of their lives is not usually such as to awaken the interest and excite the attention of the uninitiated outside world. Mr. Billings was no exception in this respect. Leading a quiet and unobtrusive life, and busily absorbed in his favourite pursuits, his name was less known throughout the Province than his high scientific merits deserved. His contributions, however, to the various departments of natural history, we have good reason to believe, were highly appreciated by those most competent to judge of their value,

and more than one foreign scientific society gave his name a place on the roll of their membership. Had he possessed more ambition and been burdened with less modesty, there is scarcely any position in the paths of science to which he might not have successfully aspired. He had what one might almost characterize as a morbid shrinking from publicity. He was out of his element in a crowded room. He loved not the busy haunts of men; but, charmed "by the breath of flowers, he fled from city throngs and cares, back to the woods, the birds, the mountain streams." Much to the regret of his friends, he could never be induced to take prominent part in any public enterprise. As a striking instance of this, and as confirmatory of what is now stated, it may be mentioned that when he was President of the Ottawa Natural History Society—an office to which he was elected as a recognition of his acknowledged ability—he could never be persuaded to preside at any of the meetings. He uniformly, on some pretext or other, always managed to shirk the distasteful duty. Nor did this arise from any want of interest in the proceedings, for he was one of its warmest and most active supporters, and contributed many valuable Botanical and Entomological specimens.

Mr. Billings was born at Billings Bridge, a small village in the immediate neighbourhood of what is now the city of Ottawa, on the 19th of January, 1819. He was descended from a Welsh family that came to America about the year 1740. His grandfather, Dr. Elkanah Billings, after graduating at Harvard University, served for some time as surgeon under Washington, during the Revolutionary War. His father removed to Canada sometime previous to the year 1804, and engaged in lumbering operations on the Rideau River. At this time there was only one house, on the south side of the Ottawa River, within 50 miles of his clearing. The whole of the Ottawa valley was then a comparative wilderness, with few indications of the material prosperity which has since become every where so apparent. It might be interesting to glean some of the incidents connected with the first settlement of this part of Canada, but as this would be foreign to the purpose of this paper, we forbear.

Of the early years of Mr. Billings little need be said; although, by this time, considerable progress had been made by the various settlements that had been gradually formed in this section. Still, as can be easily imagined, he experienced his full share of the trials and hardships incident to a life in the backwoods. Access to books must have been a favor which few enjoyed, and the facilities for education were of the most meagre description.

Accordingly, we find that he was sent to Potsdam Academy, in the State of New York, to prosecute his studies. Here he remained for some considerable period, paying special attention to mathematics, with the view of fitting himself for a land surveyor. He does not appear, however, to have had any special liking for this profession, for he soon gave it up, and betook himself to other avocations. Between the years 1842—52, he held various appointments, such as Clerk of the Crown, Clerk of the Bankrupt Court, Registrar of the Surrogate Court, &c., &c.

In the fall of 1854, he removed with his family to Prescott, where he was appointed General Agent of the Bytown & Prescott Railway. He subsequently, and up to within a short time of his death, held other offices in connection with the same Company. He remained in Prescott until the spring of 1863, when he returned to Ottawa, where he afterward permanently resided. It was while living in Prescott that he began, systematically, the study of Botany and Entomology. These continued to be his favourite branches, although he also gave some attention to Geology and Mineralogy.

Mr. Billings' Botanical collection, which pretty thoroughly exhausted the field around Prescott and Ottawa, consisted of 1897 species, and embraced about one half of the entire number contained in Gray's Manual. It is now the property of the Ottawa Scientific and Literary Society. His collection of Entomological specimens was also extensive and valuable. Besides contributing to the Smithsonian Institute of Washington, and to various private collections, he presented a large assortment of Coleoptera and Lepidoptera to the Literary and Scientific Society of Ottawa. Considering the very limited opportunities at his disposal, it is surprising that he was able to accomplish so much as he did. His close and unremitting attention to his office duties might have been supposed to discourage him in the prosecution of his favorite researches. But such was not the case. When the day's work was over, it was to him always a source of the highest enjoyment to get away into the country, and hold converse with Nature. He loved not merely the flowers, he also enjoyed the haunts where they are to be found. By the lonely river-bank

"He lingered many summer hours,
Deep in the olden forests he sought the sweet wild flowers."

In later years his attention was mainly directed to Entomology, and to it he devoted every spare hour that chance threw in his way. He was often to be met with, net in hand, in out-of-the-way places, following his

congenial work, and woe betide the heedless buzzing beetle that crossed his path.

Among his contributions to various scientific periodicals may be mentioned the following:—In the *Canadian Naturalist* of Feburary, 1858, and February, 1860, he published a "List of Plants found growing in the Neighbourhood of Prescott." To the annals of the Botanical Society of Kingston, he furnished a "List of Plants growing principally within 4 miles of Prescott, and on Laurentian Rocks west of Brockville, 72 species." In the transactions of the Ottawa Natural History Society, he published a "List of Plants collected in the vicinity of Ottawa during the season of 1866, consisting of 405 species." Occasional papers also from his pen may be found in the CANADIAN ENTOMOLOGIST. In Vol. 1, pages 28 and 60, he discussed the subject "On a station for *Melitæa Phaeton*," and in the same volume, page 45, is a paper on "*Diurnal Lepidoptera* observed in the neighbourhood of Ottawa during the season of 1868." Whether this comprises all that he wrote for the ENTOMOLOGIST we are not in a position to say. Writing scientific articles was a kind of amusement he did not much relish, and but for the importunities of his friends, even the few above mentioned might not have been penned.

That Mr. Billings had made for himself a substantial reputation as a Naturalist, is shown by the fact that he was elected to positions of honor by several scientific societies, as a recognition of the valuable services rendered by him to the cause of Natural History. He was the first President of the Ottawa Natural History Society in 1864. In 1866 he was elected one of the Vice-Presidents of the Entomological Society of Canada. When the Royal Botanical Society of Canada was organized, he was one of the original Fellows. He was also a corresponding member of the Entomological Society of Philadelphia, and of the Portland Society of Natural History.

Mr. Billings died at the comparatively early age of 53, on the 29th of September last, deeply regretted by a large circle of warmly attached friends.—COMMUNICATED.

ABBOTT'S NOTES ON GEORGIAN BUTTERFLIES.

BY SAMUEL H. SCUDDER, BOSTON, MASS.

A few months ago, I spent some time over the rich collection of drawings by Abbott, now in the British Museum. Thinking that some of his memoranda may not be unacceptable to the readers of your maga-

zine, I transcribe the substance of what is written on those butterflies which occur in the North as well as in the South, no copy of the others having been taken. The botanical names of the plants have, in most cases, been inserted in the MSS. by some subsequent student; those which bear the initials A.W.C., are due to the kindness of Dr. Chapman.

The drawings of the butterflies are contained in the 6th and the 16th volumes of the series of Abbott's MSS., the former comprising the perfect insects only, the latter the earlier stages as well. In this article the sequence of the MSS. is followed. The Roman characters refer to the folios, the Arabic to the figures. Names repeated in the two volumes are prefixed by an asterisk.

VOLUME VI.

*I., 1.—*Glaucus;* not common.

*III., 7—8.—*Troilus.* Taken March 10; changed to chrysalis Oct. 13; bred March 10; bred again in summer; common.

*V., 10—11.—*Asterias.* Chrysalis April 20, imago May 2.

VI., 12—13.—*Philenor.* Common on plum and peach blossoms in the Spring; caterpillar pink-brown; feeds on black snake root (*Aristolochia serpentaria*, A.W.C.); chrysalis April 26, gave imago May 4; chrysalis June 21, gave imago July 5.

*X., 14—15.—*Ajax.* Flies very swift; chrysalis May 24, gave imago June 16; chrysalis in Autumn, gave imago March 2.

XI., 60—61.—*Eubule.* Caterpillar yellow, streaked and spotted with blue; chrysalis August 31, gave imago Sept. 10; chrysalis Sept. 24, gave imago Oct. 6; flies very swift.

XIII., 64—5.—*Philodice.* Taken May 10; rare; common in Virginia.

XIV., 8.—*Philodice* (pale ♀). Taken March 12; very rare.

*XV., 66—8.—*Nicippe.* Taken Aug. 7; not common.

XVI., 69—71.—*Lisa.* Taken Aug. 20; common; frequents and sucks damp ground in yards, etc.

XIX., 77—8.—*Protodice.* Taken May 13; very rare.

XX., 79—81.—*Genutia.* Taken May 21; very rare in oak woods.

*XXI., 18—19.—*Archippus.* Chrysalis April 25, gave imago May 11; not very common; flies very swift.

*XXIII., 22—3.—*Missipus*; not common.

XXIV., 48—9.—*Alope.* Not common.

XXV., 52—3.—*Eurytris.* Common; taken April 14.

XXVII., 54—5.—*Areolatus.* Taken June 5; in oak and pine woods, on the sides of the branches of trees; common; caterpillar green, and feeds on grass.

*XXIX., 28—9.—*Huntera.* Feeds on everlasting (*Gnaphalium polycephalum*, A.W.C.) spinning the blossoms together for its retreat; chrysalis April 26, gave imago May 8; chrysalis May 7, gave imago May 16; not very common.

*XXX., 30—1.—*Cœnia.* Chrysalis April 18, gave imago May 4; a second brood in the Autumn; common.

*XXXI., 36—7.—*Claudia.* Feeds on May-apples (*Podophyllum peltatum*, A.W.C.); taken April 24; breeds again in Autumn; frequents fields near swamps; not very common.

XXXII., 7.—*Idalia.* Met with by Mr. Elliot in his journey to the mountains.

XXXII., 43—4.—*Clyton.* Taken May 1 in neighbourhood of swamps; second brood taken September 5, in Ogechee and Savannah River swamps; rare.

XXXIII., 45—7.—*Celtis.* Taken May 1; very rare; also in swamps.

XXXIV., 50—51.—*Portlandia.* April 25; not very common.

*XXXV., 16.—*Ursula.* Feeds on willow, wild gooseberry, and wild cherry; chrysalis June 9; others were bred as early as April 12; not very common; frequents swamps.

*XXXVII., 24—5.—*Antiopa.* One year I met with a brood of these caterpillars on a willow, in number near 300; chrysalis April 24, gave imago May 24.

XXXIX., 9.—*Faunus.* Met with by Mr. Elliot in his tour to the mountains.

XL., 32—3.—*Bachmanii.* Frequents blossoms in fields adjoining swamps; not common.

XLIII, 38—40.—*Pharos.* Taken March 5; common.

*L., 162—4.—*Calanus.* Taken May 2; common in oak woods; caterpillar greenish-brown, with darker green marks; imago bred April 29.

*LI., 165—7.—*strigosa.* Feeds on holly and oak; tyed itself up April 27, changed to chrysalis 20th [29?], bred May 6; frequents oak fields and swamps.

*LV., 173—5.—*niphon.* March 29; very rare; near swamps and oak woods.

LVI., 176—8.—*mopsus.* May 25; oak woods; very rare.

LVIII., 13.—*Americana.* Taken by Mr. Elliot in his tour to the mountains.

*LXVI., 86—7.—*Tityrus.* Spun up in leaves Sept. 5, chrysalis Sept. 7, bred April 10; not very common.

*LXVII., 88—9.—*Lycidas.* Feeds on beggar's lice (*Desmodium*, A.W.C.); chrysalis July 10, gave imago July 23; taken fresh-bred as early as April 12; frequents swamps, hommocks, and oak woods; not very common.

LXVIII., 90—91.—*Proteus.* Feeds on wild pea-vine (*Clitoria mariana*, A.W.C.), and kidney beans; spun up July 2, chrysalis July 4, bred August 18; in some years found frequently in oak woods and fields near swamps.

*LXX., 94—5.—*Bathyllus.* Spun up June 11, bred June 24; common.

*LXXII., 96—8.—*Juvenalis.* Bred March 8; common.

*LXXIV., 43.—*Martialis.* Taken March 8 and June 7.

*LXXIV., 99—101.—*Brizo.* Feeds on wild indigo (*Baptisia?* A.W.C.); chrysalis July 27, gave out imago Aug. 5; also bred March 22; not so common as *Juvenalis.*

LXXV., 102—4.—*Accuis.* Caterpillar green, streaked lengthways with pale white; head streaked with black; feeds on blades of indian corn; chrysalis June 21, gave out imago June 29; also bred April 20; common.

*LXXVII., 108—9.—*Catullus.* Caterpillar green with a black head; feeds on common and red careless, and lamb's quarter [Abbott and Smith figure it on horsemint, *Monarda punctata*]; spun up June 18, from which imago June 26; chrysalis July 29, gave imago Aug. 5; frequents corn fields near oak woods; not very common.

LXXVIII., 110—2.—*tessellata.* Taken April 18 and Aug. 21; not very common.

LXXX., 115—6.—*verna?* Taken Aug. 20; rare.

*LXXXI., 117—8.—*Samoset.* Taken Aug. 8; rare.

LXXXII., 119—20.—*textor.* Taken May 8; not common.

LXXXIII., 121—3.—*vialis.* Taken April 27 in oak woods; not very common.

LXXXVI., 157—159.—*Vitellius.* Caterpillar of a pale brown-greenish colour; feeds on buffalo-grass; spun July 25, chrysalis July 27, from which imago Aug. 4; not common.

*LXXXVII., 170—2.—*Tarquinius.* Tied up April 12, chrysalis April 14, from which imago April 25; feeds on alder; frequents swamps and oak woods; rare.

XC., 130—2.—*Delaware.* Taken Aug. 2; oak woods; not common.

XCI., 133—4.—*Zabulon.* Taken April 26 in a field; only one met with.

XCII., 135—7.—*Phytaeus.* Taken May 15; feeds on crab-grass (*Panicum sanguinale*, A.W.C.); not very common.

XCV., 141—3.—*Sassacus.* Caterpillar green, head brown; feeds on crab-grass; chrysalis Aug. 20, gave imago Aug. 30; also bred April 12; common.

XCVI., 144—6.—*numitor.* Taken April 27 and Aug. 2; frequents fields in low grounds and in oak woods; not very common.

TO BE CONTINUED.

LONDON BRANCH.

MONTHLY MEETINGS.

March.—The regular monthly meeting was held on Friday evening, March 4, at the residence of Mr. A. Puddicombe.

After the routine business had been disposed of, a letter was read from R. H. Stretch, Esq., San Francisco, Cal., announcing the fact of his having commenced the publication of a new work on Entomology, entitled, "Illustrations of North American *Zygenidæ* and *Bombycidæ*." It is to be uniform in size with the "Transactions of the American Entomological Society," and embellished with coloured figures equal in execution to those of Edward's butterflies. The work is to be issued in about thirty parts, each part to contain one plate. Part 1, containing *Alypia* 8 species, *Ctenucha* 6, *Scepsis* 1, and *Psychomorpha* 1 species, is now in press.

Intimation having been given by the Fruit Growers' Association of Ontario of their intention to issue a circular to their members, containing questions relating to fruit culture, it was suggested that some queries in reference to insects would be a valuable addition to said circular, and a committee was appointed to prepare queries and confer with the Secretary of the Fruit Growers' Association on this subject.

Mr. Puddicombe's excellent microscope was brought into use, and added much to the interest of the meeting.

April.—The meeting for this month was held on the evening of April 12, at the residence of Mr. Saunders.

The committee appointed to confer with Mr. D. W. Beadle in reference to insect queries, reported that they had completed their task.

Some interesting specimens of micro-lepidoptera were exhibited, which had been recently determined for Mr. Saunders by V. T. Chambers, Esq., Covington, Ky., among which are several species as yet undescribed. Fine photographs of insects were shown, lately received from Mr. Lintner, of Albany.

KINGSTON BRANCH.

ANNUAL MEETING.

The annual meeting of the Kingston Branch was held at the office of the Secretary on the evening of April 11, Prof. Dupuis in the chair. The report of the proceedings of the Society for the last year (the first of its existence) was read, and, on motion, was adopted. Two new members were proposed for election. On motion, Prof. N. F. Dupuis was re-elected President, E.H. Collins, Esq., Vice-President, and R.V. Rogers, jr., Secretary-Treasurer.

After the usual routine work, the members adjourned with the determination that 1872 would see them more devoted and enthusiastic followers in the tracks of the insects hosts than ever.

MISCELLANEOUS NOTES.

DETERMINATION OF SEX.—In view of the occasionally great dissimilarity in the sexes (as now received) of several species of *Lepidoptera*, it would be interesting to know how many of these have been determined from the fact of copulation, seeing that evidence of this nature, although presumptively good, cannot be considered as complete proof that the sexes so seen *in coitu* are sexes of the same species.

Almost every one accustomed to the rearing of insects is doubtless aware of this fact, but it does not seem to be very generally known; and I am tolerably certain that the decision of a very eminent entomologist, (decision perhaps not yet made public), that *H. pocohontas* is merely an aberrant female form of *H. kobomok*, is based entirely on the fact of copulation. But when two such clearly distinct species as *Samia cynthia* and *Callosamia promethea* (we will suppose the *generic difference* to amount to nothing), and species of such manifestly distinct genera as those of *Epinephele* and *Vanessa* will copulate, I think that we run no great risk in saying that copulation proves nothing, so far as the determination of species is concerned.

Perhaps I should say that I have repeatedly witnessed the copulation of *Cynthia* and *Promethea*, and my information as to *Epinephele* and *Vanessa* comes from a good source. But one instance is as good as a thousand.

It may be that a consideration of this incidental mingling of species

would throw some light on "The Origin of Species;" for although, so far as my knowledge goes, eggs laid by a female which had copulated with a male of different species have never been fruitful, it by no means follows that this is universally the case; and although with animals in a state of domestication, hybrids are not prolific, in a state of nature the case may be different. But this is beside my present purpose.—W. V. ANDREWS.

A VARIETY OF PIERIS RAPÆ UNKNOWN IN EUROPE.—Probably not a few of your readers who interest themselves in butterflies have noticed among the swarms of *Ganoris rapæ* occasional specimens differing remarkably from the normal forms in the colour of both surfaces of the wings; these, if we except the dusky markings, are of a sulphur yellow, approaching in depth of colour the wings of *Eurema Lisa*. I have had New England specimens for three years, and since my stay in this country have been endeavouring, most unsuccessfully, to find out the European name of the variety, and with good reason, for to-day having had the pleasure of a call from Mr. H. T. Stainton, of London, I set these specimens before him, and he assured me that they have nothing of the kind on this continent!

Here then we have developed a new variety of an artificially introduced species within a very short time after its appearance in America. It would be well if Mr. Bowles of Quebec, or some one in Montreal, could tell us the year in which this yellow form first appeared. Two of my specimens were taken in June and July, 1869—one by Mr. Merrill, in Shelbourne, N.H., the other by Prof. Hamlin, in Waterville, Me., and all are males. Are they confined to that sex, and the product of the later broods only? I propose to call the variety *novanglia*.—SAMUEL H. SCUDDER, Menton, France, March 6, 1872.

ADVERTISEMENTS.

EXOTIC LEPIDOPTERA AND COLEOPTERA.—I have a large collection of specimens of Lepidoptera and Coleoptera from Australia, Manilla, Mexico and Central America, which I am now arranging for the purpose of sale, as I intend confining myself to Californian insects for the future. I have also a complete set of the Pacific Railroad Survey Reports (13 volumes), in excellent condition, which I shall be glad to dispose of. Apply to JAMES BEHRENS, San Francisco, Cal.

COLLECTING TOUR IN LABRADOR.—When I penned the notice of my proposed tour to Labrador, I had no idea that there would be so much demand for Entomological material from this Northern quarter. But since the notice has appeared, letters have been received from Mr. P. S. Sprague, Boston Natural History Society; Mr. Samuel Henshaw, Boston; Mr. Geo. D. Smith, Boston, for *Coleoptera;* and Dr. Theodore L. Mead, New York; Mr. Herman Strecker, Reading, Pa.; Mr. G. M. Levette, Assist. Geolog. Survey, Indianapolis, for *Lepidoptera;* and having neglected to give my full address, possibly other letters may have gone astray. I want only 12 subscribers for *Lepidoptera*, and the terms are settled by correspondence. I am anxious to put the *Coleoptera* into the hands of one person, or an institution, who could work and determine the material, in order to put the matter in some form for future reference. I will supply notes with every species collected.—WM. COUPER, 38 Bonaventure St., Montreal.

PLATYSAMIA COLUMBIA.—I will give in exchange for a good example of this moth one hundred specimens of *Lepidoptera* of various genera from California, Southern and Atlantic United States, S. America, Europe, East Indian Archipelago, &c., or double the number for two examples; or, if it is preferable, I will pay in money. HERMAN STRECKER, Box 111, Reading P. O., Berks Cy., Pa. U. S.

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CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. IV. LONDON, ONT., MAY, 1872. No. 5

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 3.

BY E. T. CRESSON, PHILADELPHIA.

(Continued from Page 64.)

Family ICHNEUMONIDÆ.

Genus PERILITUS, Nees.

This Braconid genus belongs to Wesmael's group Polymorphes, and the species described below to Haliday's subgenus *Meteorus*, which is distinguished from the other genera or subgenera with petiolated abdomen, by the anterior wing having *three contiguous* cubital cells.

1. PERILITUS NIVEITARSIS. *N. sp.*—♂ ♀.—Ferruginous, shining; cheeks, sides of thorax and apex of abdomen thinly clothed with a short, whitish, somewhat pruinose pubescence; face and mouth pale ferruginous; palpi whitish; occiput and space enclosed by ocelli, blackish; antennæ entirely dark fuscous; prothorax and sutures of mesothorax blackish; metathorax rounded, reticulated and with a transverse arcuate carina before the middle; tegulæ pale yellow; wings hyaline, iridescent, costal nerve and stigma pale yellow or ferruginous, nervures fuscous; second cubital cell subquadrate, broader at base; interno-discoidal cell of same length as the externo-discoidal; recurrent nervure on a line and confluent with the intercubital nervure; four anterior tibiæ except tips, their tarsi and base of posterior tibiæ yellowish, posterior tarsi white, apex of posterior tibiæ fuscous, terminal joint of all the tarsi black; abdomen smooth and polished, first segment rugulose, sides margined, the disc with a faint longitudinal carina, lateral tubercles tolerably well developed; ovipositor nearly as long as abdomen, ferruginous, sheaths black. Length .30 inch.

Hab.—Massachusetts. Two ♀, three ♂, specimens. This is our largest species, and is easily recognized by the white posterior tarsi, the color of the body being much darker than that of the next species.

2. PERILITUS PALLITARSIS. *N. sp.*—♂.—Yellow ferruginous or honey-yellow, shining, thinly clothed with a short whitish pubescence;

palpi whitish ; antennæ pale ferruginous, dusky at tips, incisures of joints blackish ; metathorax finely reticulated, with an angular carina before middle and several other irregular carinæ ; tegulæ pale yellow ; wings hyaline, iridescent, nervures and stigma fuscous, neuration as in preceding species ; legs, except posterior femora, paler than body, posterior tarsi whitish, apex of their tibiæ dusky, last joint of all the tarsi black ; abdomen smooth and polished, first segment long and slender, especially at base, finely rugose, sides margined, lateral tubercles prominent. Length .25 inch.

Hab.—New Jersey. Smaller and paler than *niveitarsis*, to which it is closely allied.

3. PERILITUS COMMUNIS. *N. sp.*—♂ ♀.—Pale yellowish-ferruginous or honey-yellow, shining, slightly pubescent ; palpi whitish ; antennæ slightly dusky at tips, sometimes entirely dusky above ; metathorax rather coarsely reticulated, with several more or less distinct longitudinal carinæ, sometimes more or less dusky ; tegulæ occasionally pale yellow ; wings hyaline, iridescent, nervures and stigma vary from pale yellow to fuscous ; second cubital cell subquadrate, broader posteriorly, recurrent nervure on a line and confluent with intercubital nervure ; interno-discoidal cell shorter than extèrno-discoidal ; legs generally paler than body, sometimes unicolorous, terminal joint of tarsi blackish, sometimes the apex of posterior tibiæ and their tarsi are more or less dusky ; abdomen smooth and polished, first segment finely and longitudinally aciculated, that of the ♂ generally more or less fuscous, rarely entirely black, apical segments sometimes discolored ; ovipositor of ♀ as long as first abdominal segment, sometimes longer. Length .18—.22 inch.

Hab.—Connecticut ; New Jersey. Twenty-five ♀, twenty-one ♂, specimens. Smaller and paler than *pallitarsis*, from which it is readily distinguished by the posterior tarsi not being white.

4. PERILITUS INTERMEDIUS. *N. sp.*—♂.—Yellow-ferruginous, varied with blackish, shining, sub-pubescent ; palpi whitish ; antennæ black, scape yellowish beneath ; spot enclosing ocelli, occiput, prothorax above, two spots before anterior coxæ, pectus, lateral lobes of mesothorax, two lines on middle lobe and metathorax above except apex, black ; metathorax broad, rugulose ; tegulæ pale yellow ; wings hyaline, iridescent, nervures and stigma fuscous ; second cubital cell transversely subquadrate, broader posteriorly, otherwise as in *communis* ; legs pale yellowish-ferruginous, coxæ, trochanters and knees paler ; posterior tibiæ darker

and all the tarsi dusky; abdomen smooth and polished; first segment more robust than usual, black, finely aciculated longitudinally, lateral tubercles prominent; second segment orange-ferruginous; remaining segments blackish. Length .20 inch.

Hab.—Massachusetts.

5. PERILITUS PROXIMUS. *N. sp.*—♂.—Yellowish-ferruginous, shining, very finely pubescent; palpi whitish; space enclosed by ocelli and occiput blackish; antennæ black above, brown beneath, scape ferruginous; space each side of scutellum, space before anterior coxæ, pectus and metathorax above except apical margin, black; metathorax broad, rugose; tegulæ pale yellow; wings hyaline, iridescent, nervures fuscous, stigma pale; second cubital cell obliquely quadrate, transverse, otherwise as in *communis;* legs yellowish-ferruginous, tips of tibiæ and tarsi entirely blackish; abdomen smooth and polished, slender, especially first segment, which is very faintly aciculated and margined laterally with blackish. Length .18 inch.

Hab.—Illinois. Resembles *intermedius*, but while the thorax is more robust, and the metathorax differently and more coarsely sculptured, the abdomen is more slender and the first segment almost smooth.

6. PERILITUS VULGARIS. *N. sp.*—♂ ♀.—Pale yellowish-ferruginous, shining; space enclosed by ocelli blackish; antennæ dusky above and at tips, long in ♂, shorter, more robust and paler in ♀; lateral lobes of mesothorax and pleura sometimes more or less dusky; metathorax rather coarsely reticulated, black; tegulæ pale yellow; wings hyaline, iridescent, nervures pale fuscous, stigma pale luteous; neuration similar to that of *proximus;* legs uniformly pale yellowish, tips of tarsi dusky; abdomen smooth and polished, more or less discolored at apex; first segment black or blackish, more or less pale at base, broad at apex, minutely aciculated longitudinally; ovipositor as long or longer than first abdominal segment. Length .15—.17 inch.

Hab.—Illinois; Texas. Thirteen ♂, five ♀, specimens.

7. PERILITUS DIMIDIATUS. *N. sp.*—♀.—Black, shining; face, mouth and orbits ferruginous; palpi pale; antennæ ferruginous, scape above and tip of flagellum dusky; mesothorax piceous, rufo-piceous, or black varied with rufo-ferruginous; scutellum more or less and prothorax laterally, ferruginous; metathorax rugose; tegulae pale; wings hyaline, iridescent, nervures and stigma fuscous, the latter pale at base; second cubital cell obliquely subquadrate, broader posteriorly, the recurrent ner-

vure not on a line with the intercubital nervure, but received by the second cubital cell near its basal corner; interno-discoidal cell slightly shorter than the externo-discoidal; legs pale yellowish-ferruginous, tarsi paler, their terminal joint black, apex of posterior femora above, tips of their tarsi and near their base, dusky; abdomen smooth and polished, first segment slender, black, finely and longitudinally aciculated; second segment pale luteous; third and following segments more or less blackish; ovipositor generally as long or longer than first abdominal segment, sometimes nearly as long as abdomen. Length .16 inch.

♂.—Antennæ longer and more or less dusky or blackish above; occiput blackish; thorax generally entirely black, except more or less of prothorax and sometimes the scutellum; legs sometimes uniformly pale honey-yellow; the tarsi generally more or less dusky; third and following abdominal segments black. Length .14—.16 inch.

Hab.—New Jersey; Pennsylvania; Illinois. Five ♀, four ♂, specimens. A ♀ specimen from Arizona has the abdomen beyond first segment pale luteous, slightly discolored at apex. It appears to be only a variety.

8. PERILITUS HUMILIS. *N. sp.*—♀.—Black; mouth, palpi and antennæ ferruginous, the latter dusky above, short, with close set joints; face and cheeks piceous; metathorax rugose; tegulæ pale yellowish; wings hyaline, iridescent, nervures and stigma fuscous; second cubital cell quadrate, recurrent nervure on a line and confluent with the intercubital nervure; interno-discoidal cell shorter at base than the externo-discoidal; legs pale honey-yellow, posterior pair more or less dusky, base of posterior tibiæ pale; abdomen black, second segment pale honey-yellow; ovipositor as long as thorax and abdomen together. Length .14 inch.

Hab.—Illinois. Closely allied to *dimidiatus*, but distinct by the black head and shorter antennal joints.

ABBOTT'S NOTES ON GEORGIAN BUTTERFLIES.

BY SAMUEL H. SCUDDER, BOSTON, MASS.

Continued from Page 77.

VOLUME XVI.

*XVI., 274.—*Turnus.* Feeds on the ash figured (*trifoliata*), and on swamp ash (*Fraxinus platycarpa?* A.W.C.); chrysalis June 20, gave imago July 4.

*XVII., 1.—*Glaucus.* Feeds on swamp-ash and hickory; chrysalis Oct. 13, gave imago April 2.

*XIX., 76.—*Asterias.* Chrysalis June 22, gave imago July 4; chrysalis Aug. 18, gave imago Aug. 27.

*XX., 77.—*Troilus.* Spins a leaf together, quits it and makes another as it grows larger; caterpillar is called Mellow Bug, from the musky scent; chrysalis June 22, gave imago July 6; chrysalis Oct. 31, gave imago March 10.

*XXI., 78.—*Ajax.* Chrysalis May 22, gave imago June 16; chrysalis May 12, gave imago March 22.

*XXIII., 3.—*Ursula.* Chrysalis May 28, gave imago June 4; chrysalis June 9, gave imago June 18.

*XXIV., 4.—*Misippus.* Chrysalis July 3, gave imago Aug. 7.

*XXVI., 108.—*Archippus.* Feeds on butterfly weed and milky parsleys; chrysalis April 25, gave imago May 11; chrysalis May 12, gave imago May 22.

*XXVII., 5,—*Antiopa.* Chrysalis April 24, gave out imago May 4. "The large red wasps are great enemies to this species, seizing on a caterpillar and cutting it to pieces, to make into a lump, the better to carry it to their nest, to feed their young with."

*VIII., 28.—*Cœnia.* Feeds on *Gerardia purpurea;* chrysalis Sept. 29, gave imago Oct. 14.

*XXIX., 65.—*Claudia.* Feeds on passion flower (*Passiflora incarnata*, A.W.C.); ground colour of chrysalis is silver, or more like polished mother-of-pearl, spotted with gold and black; chrysalis May 9, gave imago May 20.

*XXXI, 109.—*Huntera.* Feeds on everlasting and sunflower; chrysalis April 7, gave imago April 17; chrysalis June 15, gave imago June 22.

*XXXIII., 66.—*Nicippe.* Feeds on yellow indigo (*Cassia occidentalis?*) chrysalis Aug. 8, gave imago Aug. 16.

XXXIV., 7.—*Ismeria* (Carlota Reek.) Feeds on cross wort (*Helianthus trachelifolius?*) and sunflower; frequents oak woods of Bruke Co., but is not common; tied up May 15; chrysalis May 17, from which imago May 26.

*XXXV., 80.—*Tarquinius.* Feeds on Indian arrow-wood and alder; it is partly covered with a white loose down; frequents swamps, but is rare; most frequent in Big Ogechee Swamp.

*XXXVI., 112.—*Niphon.* Feeds on short-leaved pine (*Pinus inops?* on the MSS. Probably *P. mitis*, as *P. inops* is not found in Georgia so

far as I know, A.W.C.); chrysalis June 5, gave out imago March 24; frequents oak woods; rare.

XXXVII., 176.—*humuli.* Feeds on parsley leaved haw (*Cratægus coccinea*, MSS.; *C. apiifolia*, A.W.C.), pine, snap beans (common garden bean, A.W.C.); chrysalis April 30, gave out imago May 4.

*XXXIX., 111.—*strigosa.* Feeds on narrow leaved jagged black oak (*Q. catesbyi*), and other oaks; very rare; chrysalis April 18, gave imago May 5.

*XL., 81.—*calanus.* Feeds on red oak and other oaks (*Q. falcata*), and hickory; butterfly frequents chinquesin blossoms (*Castanea pumila?* A. W. C.), and not uncommon in oak woods; chrysalis April 28, gave imago May 10.

XLII., 12.—*Irus.* Feeds on swamp huckleberry (*Vaccinium corymbosum?* A.W.C.); frequents borders of Ogechee River Swamp only; the butterfly frequents the blossoms of the Red bud (*Cercis canadensis*, A.W.C.) in the old fields, and is far from common; chrysalis April 20, gave out imago May 6.

*XLIV., 11.—*Lycidas.* Feeds on beggar's lice (*Desmodium*, A.W.C.) or indigo, and is first of the colour of fig. 1; when it sheds its skin for the last time it becomes of the colour of fig. 2 [i. e., the yellow markings become pink.]

*XLVI., 9.—*Tityrus.* Feeds chiefly in the night; they all [i. e., the *Hesperians*] "fold and spin a leaf together for their retreat; when they are small, only a small part of the leaf, quitting them and making them larger as they grow bigger, and sometimes, when it is a vine, in a leaf of the bush the vine grows on, for their greater safety from birds."

*XLVII., 173.—*Bathyllus.* Feeds on wild bean; chrysalis June 21, gave out imago July 2; chrysalis July 25, gave out imago August 5.

*XLVIII., 174.—*Juvenalis.* Feeds on wild indigo (a *Baptisia*, A.W.C.) and oaks, particularly the narrow leaved winter green oak (*Q. phellos*, A.W.C.); spun up and left off eating Oct. 3; chrysalis first week in February, and imago Feb. 24; another spun June 25, changed to chrysalis June 27, and gave out imago July 5; another spun August 22, changed to chrysalis August 24, and gave out imago Sept. 2.

*XLIX., 175.—*Brizo.* Feeds on wild indigo and oaks; spun up in Oct., changed to chrysalis in March, from which imago April 21.

*L., 136.—*Martialis.* Feeds on red shank or red root (*Ceanothus ameri-*

canus and *Lachnanthes tinctoria*, go by the latter name at the north, A.W.C.); spun up in the leaves June 25, gave out imago July 8.

*LII., 84.—*Catullus.* Feeds on Origanum (a *Labiate*, A.W.C.), and horsemint (*Monarda punctata.*)

*LIII., 85.—*Samoset.* Feeds on a species of wild oats (*Andropogon arenaceum*); spun itself up in the leaves May 31, and gave out imago June 14; the caterpillar is very rare; the butterfly frequents the oak woods, but is not common.

LIV., 137.—*tessellata.* Feeds on wild tea (*Sedа*); spun itself up in the leaves June 25, and gave out imago July 7.

LVII., 212.—*Argiolus* of Smith-Abbott. Feeds on the wild kind of bean figured (*Erythrina tuberosa*), holly, &c.

LVIII., 242.—*Comyntas.* Feeds on the kind of wild pea figured (*Galactia*); also on red root, &c.; chrysalis June 16, gave out imago June 24.

I will add a list of the plants accompanying the butterflies figured by Smith-Abbott in their work on the Insects of Georgia. For these also I am indebted to the kindness of Dr. A. W. Chapman :—

I. *Asterias;* Garden Fennel. II. *Troilus;* Sassafras officinale. III. *Philenor;* Aristolochia serpentaria. IV. *Ajax;* Asimina triloba. V. *Eubule;* Cassia marilandica. VI. *Archippus;* Asclepias tuberosa (not curassavica). VII. *Gilippus;* Asclepias obtusifolia. VIII. *Coenia;* Linaria canadensis. IX. *Huntera;* Gnaphalium polycephalum. X. *Ursula;* Vaccinium stamineum. XI. *interrogationis;* Tilia pubescens. XII. *Vanillæ;* Passiflora incarnata. XIII. *areolatus;* Grass. XIV. *Favonius;* Quercus nigra. XV. "*Argiolus;*" Erythrina herbacea. XVI. *Otho;* Sisyrhinchium anceps. XVII. *Vitellius;* Panicum crus-galli. XVIII. *Proteus;* Clitoria mariana. XIX. *Tityrus;* Robinia pseud-acacia. XX. *Lycidas;* a broad leaved form of Desmodium paniculatum. XXI. *Juvenalis;* Galactia pilosa. XXII. *Bathyllus;* Rhynchosia tomentosa. XXIII. *Accius;* Wistaria frutescens. XXIV. *Catullus;* Monarda punctata.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—We learn that the annual meeting will be held this year at San Francisco. In a little while, doubtless, further details will be given of the arrangements that the various railways may be willing to make for those desirous of attending this meeting.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from page 69.

Gracillaria juglandiella, ante p. 28, and
Hyponomeuta euonymella, ante p. 42.

When the descriptions of these species were prepared, I had forgotten that species had previously been described in Europe as *G. juglandiella* and *H. evonymella.* I have not seen these European species nor even any description of them, and *possibly* my species may prove to be the same. At any rate the names are so nearly the same as to necessitate a change of those, my species, and I therefore name them respectively *G. juglandisnigrella* and *H. orbimaculella.*

PARASIA.

1. Parasia griseaella.

Head and palpi white; the head sparsely dotted with brown; second joint of the palpi brownish, the third tipped with brown and with a brown annulus in the middle; antennæ brown; thorax mixed white and brown; wings white, overlaid with brown, so as to give a greyish cast; in the costal and apical portions of the wing the brown scales are condensed into numerous irregular and indefinite spots and streaks. *Alar ex.* $\frac{9}{16}$ inch.

Collection of Mr. Wm. Saunders, London, Ont.

Possibly this may be a *Gelechia*, as I have not examined the neuration.

STROBISIA.

This genus was erected by Dr. Clemens *(Proc. Acad. Nat. Sci. Phila., 1860, p. 164)* for certain species related to *Gelechia*, differing from it mainly in the neuration of the wings, and in that respect approaching *Depressaria.* The apex of the anterior wings is, however, much more obtusely rounded than in either of those genera, and the neuration is not identical in the two species (*S. iridipennella* and *S. emblemella*) described by Dr. Clemens. As objects for the low powers of the microscope, the species are among the handsomest known to me.

1. S. Aphroditeella. N. sp.

Tongue and palpi white; face white, strongly tinged with purplish; head, thorax and anterior wings very dark golden or bronzy brown, vary-

ing to brownish golden, tinged with purple and topaz red, with the changes of the light; on the costa are three indigo or violet-blue streaks, the first and second oblique, the third straight; the first is the longest, and placed about the basal third of the costa; the third is before the ciliæ. Near the base, upon the disc, is a short, very oblique streak of the same hue, pointing towards a small spot of the same hue placed within the dorsal margin at about the basal fourth; on the disc, almost between the points of the first and second costal streaks, is a minute spot of the same hue, and before it, near the dorsal margin, is a very short longitudinal spot of the same hue, and almost in a line with the first costal streak; two other small spots of the same hue situated behind the two last named, form, with them, a trapezoid; four small spots of the same hue around the apex, each situated between two of the apical veins. All of these streaks and spots vary with the light, through purple, crimson and topaz red. Ciliæ metallic, with two wide, hinder, marginal lines of the general hue; legs of the general hue, with the tibiæ tipped and the tarsi annulate with white. *Alar ex.* ½ inch. Kentucky. Common.

This is one of the most exquisite little gems that I have found among the "Micros." It evidently bears a very close resemblance to *S. iridipennella* Clem., (which, however, is unknown to me) and if Dr. Clemens' description could be supposed to be imperfect, it might be the same insect. But I cannot recognize it in his description. He says that the first costal streak in *S. iridipennella* is placed about the middle of the wing, instead of about the basal third, as in this species. In *S. iridipennella* the third costal is oblique; in this species it is straight. He mentions only one spot near the base, instead of two, and he says that *iridipennella* has "three spots beneath the second costal streak, one in the fold and two in the middle of the wing," instead of the four forming the trapezoid.

These differences will enable the reader to distinguish the species; the shape and neuration of the wings is the same in both. In *S. emblemella*, which is unknown to me, Dr. Clemens says that the posterior margin of the wings is oblique, and the neuration also differs slightly from that of *S. iridipennella* and this species.

The larvæ of all the species are unknown. The imagines have a curious habit, when they alight upon a leaf, of strutting rapidly about over its surface with the wings a little spread, and, as Dr. Clemens says, of driving away other "little people" from their neighbourhood. When they finally settle down, however, they are not very easily alarmed.

2. S. Venustella.

Tongue, palpi and face silvery white, except a streak along the upper surface of the palpi and the tip of the terminal joint, which are dark bronzy brown. Antennæ, head, thorax and abdomen, on their upper surfaces, dark bronzy or golden brown; anterior wings dark golden or bronzy brown, with many scattered golden scales in the dorso-apical portion, a broad blue fascia at the base of the wing, and a costal streak of the same hue before the middle, pointing obliquely backwards and reaching nearly to the middle; a dorsal streak of the same hue begins opposite the apex of the first costal and points obliquely backwards, almost reaching a discal spot of the same hue which is situated just within the second costal. The second costal is placed just beyond the middle, is concave towards the base of the wing, is narrow, brilliant and reaches nearly to the middle of the wing; the second dorsal is opposite the second costal, is short and points obliquely towards, but does not attain, the discal spot. The third costal streak is placed at the beginning of the ciliæ, it is small, and opposite to it, near the posterior margin, are are two small longitudinal spots and some scattered scales of the same hue. Apical ciliæ silvery; dorso-apical ciliæ tinged with yellowish; two hinder marginal lines, one at the base of the ciliæ, the other at the apex. *Alar ex.*, scarcely over ⅓ inch. Kentucky. Rare.

There is the same play of colors as in the preceding species, which it rivals in beauty. The specimen was taken strutting about on the leaves of the Buckeye *(Aesculus glabra)*, but the larva and food plant are unknown. This species appears to bear some resemblance to *S. emblemella* Clem.; but, having but the single specimen, I have not examined the neuration of the wings.

DEPRESSARIA.

The species of *Depressaria* resemble those of *Gelechia* somewhat in structure, but may readily be distinguished from them by the *depressed* abdomen (whence the name), and the divided *brush* on the under side of the second joint of the labial palpi.

Of the eleven species described herein, all are properly placed in this genus, except, probably, *D. cryptolechiella* and *D. dubitella*, and these do not seem to differ from it more than some European species which are usually located here. The neuration of the wings is the same in all of them, except as stated below, and is that of the true species of this genus. (Dr. Clemens, in his generic diagnosis of this genus, says that the median

vein of the hind wings is *two branched.* This is an error. All of these species agree with the figure in Westwood's introduction, in having it *three branched.*) *D. cryptolechiella* and *D. dubitella* differ from *Depressaria* in the form of the palpi, which, in the former, are like those of *Gelechia*, except, perhaps, that they are a little slenderer and more elongate, while in *D. dubitella* the brush is very small, though divided. In *D. cryptolechiella* the hind wings are not excised beneath the tip. Both of these species also have the neuration, though not the shape of the hind wings, as in *Strobisia*, rather than *Depressaria*, the difference being that in *Strobisia* the subcostal vein is *trifid from the discal vein which gives off a single vein*, while in *Depressaria* the subcostal *is simple and the discal vein gives off two branches*—as though a branch of the subcostal of *Strobisia* had been separated and placed a little lower down on the discal vein. Otherwise these two species also agree with *Depressaria.* These species all have the wings comparatively narrower than most of the European species; shaped rather like *D. Aplana* (or even narrower) than like *D. umbellana*, as those species are figured by Stainton. They are wider, however, in *D. Cryptolechiella* than any of the others.

The prevalence of dark brown or dark ochreous colors seems to be characteristic of the genus; and comparing my species and Dr. Clemens' descriptions of *D. atrodorsella*, *cinereocostella* and *pulvipennella*, and Dr. Packard's description of *D. robiniella*, and Mr. Bethune's description of *D. Ontariella* with the figures in Stainton's *Vol. 9, Nat. Hist. Tin.*, and other figures by Stainton and Douglass in the *Trans. Lond. Ent. Soc.*, those colors *seem* to prevail to a greater degree in the American than in the European species. The known American species are, however, too few as yet to predicate this statement generally.

1. *D. Cryptolechiella. N. sp.*

Third joint of the palpi black, with a narrow longitudinal white line on each side. Second joint pale yellow with a narrow longitudinal black line beneath. Antennae pale yellow, checkered above with black and with a narrow longitudinal black line on each side of the basal portion. Head, thorax and base of the anterior wings dull reddish-orange; anterior wings to the naked eye, pale golden, with the lustre of 'watered' silk, produced by a multitude of transverse, narrow, wavy, dark brown lines, as seen under the lens; six small dark brown spots in a row around the apex, to the naked eye appearing like a narrow marginal line. Ciliae pale fuscous, with a silvery lustre and a somewhat darker hinder marginal line at

their base. Hind wings yellowish white with a silky lustre. *Alar ex.* $\frac{9}{16}$ inch.

Possibly this may belong to *Cryptolechia*, but I have no knowledge of that genus other than Mr. Stainton's brief mention of it in the volume before mentioned.

2. D? dubitella. N. sp.

Palpi very large, *brush small*, face and palpi yellowish white. Head, thorax, antennae and anterior wings dark brown, with three microscopic ochreous spots, one at the beginning of the costal ciliae, an opposite dorsal one and one on the disc, forming nearly an equilateral triangle. Posterior wings pale fuscous. *Alar ex.* ½ inch. Kentucky. Larva unknown.

3. D. albisparsella. N. sp.

Dark brown; extreme tip of third joint of the palpi white. Fore wings faintly suffused with ochreous and sparsely and indistinctly sprinkled with white scales, which at the beginning of the costal ciliae become a little more distinct, forming a narrow, clouded whitish fascia pointing a little obliquely backwards; tips of the ciliae whitish. *Alar ex.* a little over $\frac{5}{8}$ inch. Kentucky. Larva unknown.

4. D. bistrigella. N. sp.

Palpi with the second joint ochreous, dusted with dark brown; third joint dark brown tipped with whitish. Face very pale ochreous, dusted with brown; antennae brown; thorax and anterior wings dark brown, a little bronzed and with a little ochreous intermixed, especially in two small patches, one of which is just before the middle and the other about the middle of the wing; a small whitish costal streak at the beginning of the costal ciliae and another at the beginning of the dorsal ciliae; ciliae pale ochreous dusted with brown at their base; posterior wings pale ochreous with a silvery lustre. *Alar ex.* $\frac{5}{8}$ inch.

Collection of Mr. Wm. Saunders, London, Ont.

ENTOMOLOGICAL REPORT FOR 1871.—We are glad to be able to state that this Report is now printed, and will be mailed to the members in a few days.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 57.)

[173.] 229. CALLIDIUM SIMILE *Kirby*.—Length of body 7 lines. A single specimen taken with the preceding species.

This species in most respects is so like *C. M. Proteus*, that I had set it by as another variety; but upon further consideration I am induced to give it as distinct, since it differs not only in colour but in the form and sculpture of the prothorax and other parts.

The apex of the palpi is more dilated, so that it is strictly securiform; the front behind the antennae is elevated and gibbous, with few scattered punctures: the sides of the prothorax are more puffed out, and much more minutely and thickly punctured, and there is a pair of impressions in the disk: the antennae also at the base are rufous: in other respects it does not differ from *M. Proteus*.

[This species, together with the preceding and the subsequent one, belong to the genus *Phymatodes* Muls. It is probably another variety of the very variable *Proteus*, as it has not been identified by any author that we are aware of.]

230. CALLIDIUM DIMIDIATUM *Kirby*. Length of body 4 lines. Two specimens in Lat. 54°.

Body not glossy; impunctured; hairy underneath; and except the forebreast, which is black, of a dull rufous. Head channelled between the eyes, behind them convex; antennae rufous, shorter than the body: prothorax somewhat coarctate at the base; minutely granulated; obsoletely channelled, more conspicuously behind: elytra rufous anteriorly.

This species comes very near to *C. (Merium) Alni*, but it is larger and has no white bands.

[CLYTUS PALLIATUS Hald. is a later synonym of this species. It is taken in Canada and the Eastern States; also on north shore of Lake Superior by Agassiz's Expedition.]

[174.] Sub-genus TETROPIUM *Kirby*.—Eyes four, connected by an elevated line. Antennae robust, short: scape much incrassated, subcylindrical, remaining joints subclavated. Prothorax constricted anteriorly and posteriorly. Thighs much incrassated, sometimes clubbed.

The type of this subgenus is *Callidium triste* Fabr. for those with clavated thighs, and *C. aulicum*, for those in which they are incrassated nearly their whole length. These insects will be found to have four distinct eyes, separated by the substance of the head elevated into a ridge, which at first sight appears a continuation of the eye, but which evidently has no lenses implanted in it—they are also distinguished by their robust and short antennae.

231. CALLIDIUM (TETROPIUM) CINNAMOPTERUM *Kirby*. Plate v, fig. 8. Length of body 3¼ to 6 lines. Several specimens taken in Lat. 65°.

At first sight this species seems the exact counterpart of *Callidium triste*, which it resembles in almost every respect; but upon examination it will be found that the thighs of these two insects are of a very different shape, those of *C. T. triste* being much attenuated at the base, while those of *C. T. cinnamopterum* are not at all. In the latter also the sides of the fore-breast are red, and the elytra are considerably darker, very near the colour of cinnamon.

The American specimens vary much in size, but all agree in the shape of the thighs.

[Taken at Ottawa, Ont., by Mr. Billings; Lake Superior (Agassiz.) Not common.]

[175.] 232. CLYTUS UNDAYTUS *Kirby*.—Plate vii, fig. 5. Length of body 8 lines. Two specimens taken in Lat. 54°, 65°.

Body black, underneath hoary from decumbent hairs, above velvetty. Head anteriorly hairy with whitish hairs, behind the antennae very thickly punctured; palpi, labrum, tip of the nose and cheeks, eyes, antennae, and subface rufous; prothorax rough with very minute and numerous granules, the base and apex have an interrupted band of yellow hairs, and a hoary spot on each side produced by hairs; scutellum dark brown: elytra with an oblique linelet adjoining the scutellum, another in the disk near the base, two wavy bands, the extremities of the anterior one pointing towards the base, and of the posterior one towards the apex; the apex and suture, all pale yellow, produced by decumbent hairs: underneath on each side of the breast are three spots of the same colour, as likewise is the tip of the ventral segments of the abdomen; the legs are rufous, sprinkled with hoary hairs.

[A variety of *C. undulatus* Say.—Ent. Works, i, 119, plate 53. Taken during Long's second expedition by Say; Lake Superior (Agassiz); and throughout Canada West.]

233. CLYTUS LUNULATUS *Kirby*.—Length of body 7¼ lines. One specimen taken in Lat. 54°. Taken also in Canada by Dr. Bigsby, and in Nova Scotia by Capt. Hall.

[176.] This species is extremely similar to the preceding, but its bands and spots are quite white without any tint of yellow: the prothorax has no posterior interrupted band, the anterior spot of the elytra is crescent or kidney-shaped, the thighs are dusky; and the eyes are black; but the most striking distinction is exhibited by the head, which is perfectly smooth and without punctures, but when the occiput is disengaged from the prothorax, as it is when the head is inclined forwards, the front will be found to be separated from it by a bilobed line, behind which the head is thickly and confluently punctured.

[Probably a variety of the preceding species.]

234. CLYTUS FUSCUS *Kirby*.—Length of body 5⅓ lines. A single specimen taken in Lat. 54°.

This species resembles the last in having the occiput similarly punctured, and the markings of the elytra are similar, except that instead of the white streak at the base there is only a dot: but it is of a brown colour, with the head and prothorax nearly black: the former is distinctly granulated; the palpi, labrum, eyes, and antennae are rufous, as in *C. undatus*, and like that the prothorax has both an anterior and posterior interrupted band of white hairs; the elytra and underside of the body are reddish-brown; the legs rufous, posterior ones very long.

[Taken at Ottawa and other places in Ontario.]

235. CLYTUS LONGIPES *Kirby*.—Length of body 5¼ lines. A single specimen taken in Lat 54°.

[177.] Body reddish brown, underneath hairy, with white decumbent hairs. Head black, minutely and thickly punctured, with a longitudinal slight channel, transversely elevated between the antennae; vertex elevated; palpi, labrum, antennae and extremity of the nose, rufous: prothorax black, rather oblong, elevated longitudinally in the disk with an anterior bowed transverse ridge, followed by several minute acute tubercles, next in the middle is another shorter ridge, which is also succeeded by similar tubercles: the sides of the prothorax are granulated; between the granulated portion and elevated disk, it is minutely reticulated, with a pore in the centre of each reticulation: elytra brown, subacute, with three bands formed of decumbent white hairs; the first forming a crescent at

the scutellum, which runs along the base and down the suture; the second in the middle first running transversely, then turning upwards towards the base and again turning down so as to form a hook next the suture; the third near the apex, running transversely from the external margin to the suture and then turning upwards so as to form another crescent; there is also a dot between the two first bands near the lateral margin; there is a large hairy white spot on the sides of the breast, and the anterior ventral segments have a white hairy band at the apex: the legs are rufous, the hinder pair remarkably long.

[Included in List of Canadian Coleoptera.]

236. CLYTUS MURICATULUS *Kirby*.—Length of body 5 lines. Many specimens taken in Lat 54°.

This comes extremely near to the preceding species, but is smaller, the discoidal ridges of the prothorax are nearly obsolete, that part has four white hairy spots, the bands of the elytra are differently shaped, and the posterior legs are considerably shorter: the breast and base of the abdomen underneath are hoary with white hairs, but not always spotted and branded.

[Has not been identified as a distinct species.]

[178.] 237. HARGIUM [RHAGIUM] LINEATUM *Oliv.*—Length of body 5¼ lines. Taken more than once in Lat. 54°, and also by Mr. Drake in the province of Massachusetts.

Body black, rather glossy, hoary from longish cinereous hairs. Head constricted behind into a neck, punctured with large scattered punctures; antennae shorter than the prothorax, robust, last joint ovate, pedicel testaceous: prothorax constricted anteriorly and posteriorly, armed on each side by a stout rather sharp spine, punctured like the head, and hairy, but there are three longitudinal stripes without hairs, and the intermediate one without punctures, the lateral ones pass over the spines: elytra mottled with whitish or cinereous hairs, with three longitudinal ridges, the two external ones confluent near the apex, and a little higher up including between them a short abbreviated ridge; the interstices are punctured like the head and prothorax; at the base and lateral margin the elytra are reddish, and on the ridge next the suture there are two yellowish spots: coxae, trochanters, and base of the thighs reddish: abdomen carinated underneath.

[Taken generally from Philadelphia northwards, under the bark of pine trees.]

MISCELLANEOUS NOTES.

GEOGRAPHICAL DISTRIBUTION OF APHIDES.—The Aphis family is, as yet, very little known in low latitudes, and there are only two instances of its occurrence to the south of the equator. The first is a Madagascar genus, published by Coquerel: this genus has the fore wings more highly organized than those of any other known form of the tribe. The second dwells near New Caledonia, and is described by Montrouzier, and has much resemblance to some of the European Aphides. In Dr. Leith's collection of Bombay insects, I have observed an Aphis which, if its specific characters are not obliterated by its shrivelled condition, is identical with a common English species. The next record of the family is in North Italy, where Passerini has published a monograph of the species therein. Africa, Asia and Australia are thus almost undiscovered countries as regards Aphides, and afford a large space and require much time for research. The Aphides of America are unknown from the Southern end to the Northern States, where several new species have been described; a few there, are also species of Europe, and may have been introduced thence into America. Kaltenbach has published a work on the Aphides of Germany; and Koch another, on those of the same country; and, notwithstanding the three monographs here mentioned, and various descriptions of species in France and in Sweden, there is much yet to be discovered in Europe, especially with regard to the migratory species, and to the more or less conspicuous and numerous alternate generations, and to the influence of temperature and vegetation in changing the structure. The history of Aphides is connected with that of Coccinellae, Hemerobii, and Syrphi, which destroy them from without; and with that of Aphidiidae, Allotridae, and a few Chalcidiae, which destroy them from within; and with that of ants, which keep them as a flock, and feed on their honey. The little yellow ant lives with Aphides under ground; the black ant is a guide to the discovery of the long-beaked Aphis in the crevices of the bark of oak trees; and the large black and red ant resorts to the Aphides in woods. Some Aphides are especially subject to the attacks of Aphidii, from which other species, though equally numerous and noxious, are nearly free, weather and want of food being the agents in causing the latter to pass away. The comfrey Aphis is the frequent prey of a little red Dipterous larva, which seldom attacks other species. The fact that Aphides are stored by fossorial Hymenoptera as provision for their young is well known; and I observed an instance of it in Fin-

mark. The Aphides of that region must have a long continuance of the egg state; in England this state varies from one month to eight months, according to the species, and according to the weather. The length and season of the egg state in the Aphides of hot countries has not yet been observed, and is an interesting subject for enquiry.—*Francis Walker, in Newman's Entomologist.*

MONOHAMMUS MARMORATOR, *Kirby.*—I was so fortunate as to receive a specimen of this rare insect from a friend last summer. It was taken in Richmond Square, Montreal, on the 27th of July, 1871. Length of body one inch. The markings agree perfectly with Kirby's description, but as the antennae of his specimen were broken off, I will describe those of mine. Antennae a little longer than the body, first joint chocolate brown at the base, remainder grey, through which the brown appears in spots and streaks; second joint the same; third joint grey at the base, deepening into warm brown at the end; fourth, fifth, sixth, seventh and eighth redder brown, grey only showing a little at the base; remaining joints deep red. This is the only specimen I have got. There is another in the collection of the Natural History Society of Montreal, and Mr. Couper informs me that it was included in his Quebec List.

PIERIS RAPÆ.—This destructive butterfly was very abundant about Montreal in 1870, and ruined the cabbage gardens around the city. Last summer they were not nearly so plentiful, and this coming season I hope to see their ranks still thinner, as a good many of the chrysalids that I examined this spring contained parasites in the pupa state.—F. B. CAULFIELD, Montreal, P.Q.

COLEOPTERA TAKEN AT GRIMSBY.

Cicindela lecontei, one specimen, June 2nd. *Omophron tesselatum.*
Elaphrus clairvillei Kirby—*politus* Lec. Dr. Horn informs me that the specimen heretofore regarded by Leconte as Clairvillei, is undescribed.
Blethisa quadricollis, a specimen taken May 23rd.
Lachnocrepis parallelus, two, taken in the lake June 1st.
Stenolophus carus, about the roots of trees in the swamp, May 13th.
Tachys tripunctatus, under stones near water.
Haliplus fasciatus. Hydroporus striatopunctatus. Agabus acuductus.
Colymbetis (Scutopterus) coriaceus, Hoffm. Taken June 1st.
" *longulus*, a specimen taken also in the lake June 9th.
Hydaticus bimarginatus. H. piceus. H. liberus.

Ochthebius nitidus. Sperchopsis tesselatus. Clambus puberulus.

Adranes lecontei, four specimens taken in a nest of yellow ants, May 11th.

Ceophyllus monilis, taken in nests of yellow ants from 25th April to middle of May. *Pselaphus erichsonii. Tychus longipalpus.*

Batrisus nigricans, B. globosus, taken with other sp. of *Pselaphidæ* under leaves in the swamp. April.

Homalota lividipennis, Aleochara nitida, A. lata, A. rubripennis, Tachyporus, brunneus, Bryoporus rufescens, Mycetoporus americanus, Acylophorus pronus, Euryporus puncticollis, Philonthus sparsus, P. micans, P. sobrinus, P. terminalis, P. paederoides, Diochus Schaumii, Lathrobium puncticolle, L. rufulum, Scopaeus exiguus, Stenus stygicus, S. flavicoruis, S. annularis, S. arculus, Lathrimaeum sordidum, Prognatha punctata.

Paromalus seminulum. Bœocera apicalis.

Limulodes paradoxus. A specimen of this curious little *Trichopterygidæ* occurred in the before-mentioned nest of yellow ants with *Adranes* and *Ceophyllus*, making two blind species found in the same nest.

Prometopia sexmaculata, Trogosita marginata, Sylvanus advena, Antherophagus convexulus.

Cryptophagus cellaris. Taken in a nest of Humble bees.

Corticaria rugulosa C. picta, Psephenus lecontei, a specimen bred from a larva taken in the creek at Grimsby.

Canthon nigricornis, a dead specimen found on the lake shore June 29th.

Cremastochilus Harrisii, also taken on the lake shore.

Agrilus cephalicus, A. egenus, Cardiophorus cardisce, Athous discaleratus.

J. PETTIT.

BOOK NOTICE.—We have just received the first number of a new work on "Indigenous and Exotic Lepidoptera," *(Rhopaloceres, Heteroceres)*, by Mr. Herman Strecker, of Reading, Pa., U.S. The work is well got up in quarto edition, with colored illustrations by Mr. Strecker himself. It is to be published monthly at 50 cents a number, and we recommend it to the careful attention of our entomologists. We shall refer again to this book in our next issue.

ADVERTISEMENTS.

EXOTIC LEPIDOPTERA AND COLEOPTERA.—I have a large collection of specimens of *Lepidoptera* and *Coleoptera* from Australia, Manilla, Mexico, and Central America, which I am now arranging for the purpose of sale, as I intend confining myself to Californian insects for the future. I will not exclude from the offered sale my numerous Californian specimens. I

will continue to collect in all branches of the Californian entomological fauna, and I invite exchange. I have also a complete set of the Pacific Railroad Survey Reports (13 volumes), in excellent condition, which I shall be glad to dispose of. Apply to JAMES BEHRENS, San Francisco, California.

PLATYSAMIA COLUMBIA.—I will give in exchange for a good example of this moth one hundred specimens of *Lepidoptera* of various genera from California, Southern and Atlantic United States, S. America, Europe, East Indian Archipelago, &c., or double the number for two examples; or, if it is preferable, I will pay in money. HERMAN STRECKER, Box 111, Reading P. O., Berks Cy., Pa. U. S.

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. IV. LONDON, ONT., JUNE, 1872. No. 6

DESCRIPTIONS OF LEPIDOPTERA FROM ALABAMA.

BY AUG. R. GROTE, DEMOPOLIS, ALABAMA.

Nematocampa expunctaria, Grote. ♂.—Pale ochreous, stained, and the veins lined with a more intense shade. Transverse anterior line arcuate, dark ochreous, continued. Median shade arcuate at disc, thence running straightly downward approximate to the transverse posterior line, continued. Transverse posterior line dark ochreous, even, distinct, slightly inwardly sinuate below vein 2. No vinous shadings whatever. Secondaries concolorous, with primaries; a single even median line corresponding with the transverse posterior line of primaries. Beneath paler, whitish; secondaries immaculate; primaries with traces of transverse posterior line superiorly, and a sprinkling of ochreous scales about the costal region. Body parts concolorous with wings. *Expanse* 23 m.m.

Outline and ornamentation of *N. filamentaria*, but differing by the absence of any purplish stains, the more intense color and denser squamation, and quite prominently by the different shape of the transverse posterior line, which is less even in *N. filamentaria*, and runs sooner and more deeply inwardly, attaining the internal margin further from the angle than in *N. expunctaria*. The course of the median shade differs also; this more nearly attains the transverse posterior line on disc, and again on submedian interspace. This latter inflection is entirely wanting in *N. expunctaria*, which seems a little the larger species.

Conchylis Robinsonana, Grote. ♂.—Primaries blackish fuscous with five silvery white maculations above. The first is ovate, free from the base, well sized, touching internal margin, not attaining costal edge. The second is parallel, outwardly exserted inferiorly. Before the apices are two nearly similar sized moderate spots, and the fifth is larger and covers internal angle. Hind wings pale fuscous. Collar fuscous white; the thorax is white above. Caputal squamation pale, while the abdomen is pale fuscous. Expanse 14 m.m. Size of *C. 5-maculana Rob.*, and resembling that species, but differing in the relative size and position of the spots on the primaries, notably the basal one and that covering internal angle.

I name this little species after my friend and brother entomologist, the late Coleman T. Robinson, whose sudden death has caused so great sorrow in many circles, besides the one in which I knew him best. Who shall say now that he wasted his time in describing the little insects he loved, when it is his descriptions of new species of North American Moths that will keep his fame after death, and, in the nature of human things, long after his other qualities shall have been forgotten by men? So many are now properly sorrowing for him—I have only to remember this and be silent.

NOTES ON PIERIS RAPÆ.

BY G. J. BOWLES, MONTREAL.

The April number of the ENTOMOLOGIST contains a communication from my esteemed friend Mr. S. H. Scudder, with reference to the yellow male variety of this species. In it he asks several questions which I shall endeavour to answer, adding some other particulars to make my notes as complete as possible.

I think that entomologists will agree with me in considering *P. rapæ* as one of the most interesting insects existing on this continent, not only with reference to its destructive habits, but also on account of its recent introduction and rapid dissemination over the country. The Colorado Potato Beetle is, perhaps, the only species whose progress has been so carefully recorded; for both have "made their mark" as they spread from place to place, although the butterfly has not been such a formidable enemy as the beetle. A new subject of interest—the yellow male variety—is now added to the history of the butterfly, and it is certainly worthy of the attention of students, as it may, in the future, aid in solving some of the problems connected with climatic influences and the distinction of species.

I first met with yellow males in 1863, and mentioned it in my paper on *Pieris rapæ* published in the *Canadian Naturalist* for August, 1864. Since then I have captured similar specimens each year, and found them to be produced throughout the season. I remember taking one or two so early in the spring that I felt satisfied they belonged to the very first brood of the year, which led me to conclude that the variety is likely to appear at all parts of the season, and in every brood. Those which I captured on the wing have always been males, but, strange to tell, among

a number reared in confinement during the summer of 1864, a yellow *female* made her appearance, smaller than usual, but of as dark a colour as any that I have seen of the other sex. It may happen, therefore, that the variety may become a permanent one, and, at some future time, be regarded as a distinct species. Who knows how soon favorable circumstances may develope a new (and yellow) species of Pieris, to be called *novangliæ* or *canadensis* !

We cannot, however, claim this variety as the effect of a change of habitat and climate on *P. rapæ*, as (with all due deference to Mr.Stainton) it has been met with in England. Curtis, in his work on "Farm Insects," (quoted in my paper before referred to), speaks of having in his collection a male *P. rapæ* "taken near Oldham, in Lancashire, which has all the wings of a bright yellow colour." From Mr. Stainton's assurance to Mr. Scudder, however, that it was unknown in Europe, its occurrence on that continent must be extremely rare; very different from Canada, and especially the neighbourhood of Quebec, where I should say that, at a low estimate, one male *P. rapæ* out of five hundred is of a yellow colour, more or less intense. This estimate would allow for many specimens in a season, as, of all Quebec butterflies, our friend is decidedly the most abundant and prolific. I have seen them by hundreds, at one time, hovering over the fields of cabbages, to the dismay of the cultivators of this useful vegetable. It is curious that this variety should be comparatively common in America, and almost unknown in Europe. The fact would lead us to think that though it cannot have *originated* here, yet the tendency to diverge from the normal colour of the species has been increased by the transfer to this continent.

The Canadian *Pieris rapæ* (and, I expect, the New England as well), is, in common with some other species of the genus, subject to great variation in colour and intensity of markings, apart from the yellow variety under consideration. The spring brood is of a much purer white than those produced later in the season, and has the blackish markings less in size and paler in colour. I have often seen spring males without the spot on the upper side of the fore wings, and having the blotch on the apex so much obliterated, that I have supposed them, before examination, to be *P. oleracea*. The spot, however, is generally present beneath, and can be faintly seen through the wing. As the summer passes, the markings of the successive broods become more intense, until in the autumn, individuals (particularly females), are met with which have a greyish appearance, from the number of black scales sprinkled on the wings,

especially near the body. The illustrations on page 83 of the Report of our Society for 1871, published by the Ontario Department of Agriculture, give an exact idea of the insect at this season. This change in colour has been noticed in England; indeed, before its progressiveness had been observed, an eminent entomologist there separated the spring and autumn broods into distinct species. I quote from a letter received in 1864 from my friend Dr. Jordan, of Birmingham :—

"You are probably aware that here in England we have two distinct broods of the insect, the first appearing in April, the second in July. The first almost wants the apical spot on the top wing in both sexes, and on the male the central spot is often also quite obliterated. To this the name of *P. metra* was given by Stephens, who then supposed it a distinct species. In the autumnal brood, or typical *P. rapæ*, we have a larger and darker insect, with the spots more marked, and the black patch at the apex of the fore wing very much darker."

The yellow variety also shares in this progressive change of colour. The spring specimens are of a very delicate yellow, almost without spots, and are very handsome, while those appearing in the fall are of a sulphur yellow, and heavily marked.

Dr. Jordan speaks of there being two broods of the insect in England. I think that in Canada they are more numerous. It is impossible, however, to settle the number with certainty, as one brood encroaches on the next; and from the time when the butterflies begin to deposit their eggs on cabbage plants in the hot-beds, in April and May, until October, larvæ of all sizes and ages may be found feeding on the same plant. The short time required for the complete developement of the insect also favours the idea of there being three or more broods in one season. Some caterpillars reared by me in June, 1864, grew from one-twelfth of an inch in length to their full size, in eleven days; they then became pupæ, and seven days afterwards, the perfect insects were produced. Allowing for the influence of temperature in accelerating or retarding their changes, thirty days would be a fair average to give as the duration of each brood, and this would be equal to four or five broods in the season in the latitude of Quebec. In fact, there is no other way of accounting for their surprising numbers in the latter part of summer.

I have not yet met with any parasite infesting this butterfly, though I have found pupæ which had apparently been destroyed by them; and a fellow-student here (Mr. Caulfield) informs me that he now has about twenty chrysalids containihg some insect enemy. The most powerful

agent in lessening their numbers is, in my opinion, the intense cold of winter, for, contrary to the rule with regard to insects passing the winter in the pupal state, the chrysalis of *P. rapæ*, unless placed in a sheltered situation, does not seem to resist the effects of frost. In early spring, I have searched under the exposed coping-boards of fences, where these pupæ were suspended in scores, and very rarely found one alive; nearly all were killed and blackened by the severe cold, and any living ones brought into the house invariably died in a few days. The first brood of the year is, with regard to numbers, in wonderful contrast to the multitudes of larvæ which must have come to maturity and pupated during the preceding autumn, and this difference can only be ascribed to the destroying effects of the winter's cold upon the chrysalids. The species, in its new habitat, certainly has to pass through extremes of temperature which it has not been accustomed to in England—from which country it was most probably introduced; and while the increased summer heat of Canada appears to have made it more prolific, by augmenting the number of broods, the greater cold of winter has balanced the account by killing off the surplus, which otherwise would have rendered the insect an intolerable pest. The "compensating" principle in the laws of Nature is thus in useful operation with regard to *P. rapæ*, and as the power of cold decreases in effectiveness through the butterfly becoming acclimatized (which will probably happen in course of time), no doubt other agencies will arise in the shape of new parasitic enemies, to keep the species within due bounds.

It would be interesting to know how far this insect has now extended its range, particularly towards the west of Canada. The prediction I made in 1864 has been fully verified, as it has now spread over the Province of Quebec and the New England States; and last year destroyed $500,000 worth of cabbages in the vicinity of New York alone, according to the estimate of a leading newspaper there. It does not seem, however, to have made equal progress in Ontario. Could not our Kingston friends give us some information on this point? It would be "thankfully received and faithfully applied."

THE ENTOMOLOGICAL REPORT for 1871 has now been issued, and, we trust, is by this time in the hands of all our members. Should any fail to receive it, the Secretary will forward a copy on being notified.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from page 92.

DEPRESSARIA.

5. *D. Rileyella. N. sp.*

Brush dark brown, apical joint pale yellowish. Head, thorax, and fore wings pale yellow, faintly tinged with pink, and minutely dusted with fuscous, and with a fuscous streak on the base of the costa. Head and thorax slightly iridescent, wings scarcely so; posterior wings a little paler. Under surface and legs pale yellowish, sparsely dusted with fuscous. *Alar ex.* 5/8 inch. Named for Mr. C. V. Riley, State Entomologist of Missouri. Kentucky. Larva unknown. Also in the collection of Mr. Wm. Saunders, London, Ont.

6. *D. fuscoochrella. N. sp.*

Palpi white, flecked with fuscous; third joint fuscous, mixed above with whitish. Head pale whitish-yellow, flecked with pale fuscous, strongly iridescent. Antennæ pale yellowish, annulate with fuscous, and basal joint fuscous. Thorax and anterior wings pale ochreous, the wings suffused with fuscous at the base. A large oblique fuscous spot on the costa at about the basal fourth, reaching the fold, mixed next the costa about equally with pale ochreous. Anteriorly, this spot is distinctly outlined, but posteriorly, it passes gradually into pale ochreous, thickly dusted with fuscous, occupying the costal half of the wing, and spreading over the apical fourth of the wing, becoming darker towards the apex. Ciliæ silvery. Posterior wings and ciliæ grayish-silvery. *Alar. ex.* 1 1/16 inch. The prevailing tint of the basal costal portion of the wing is fuscous. Kentucky. Larva unknown.

7. *D. fuscoluteella. N. sp.*

Palpi dark purplish-brown. Head bronzed, purplish. Antennæ pale fuscous and yellowish. Thorax and anterior wings pale fawn colour, with a silky lustre (under the lens pale yellowish, overlaid with fuscous). Posterior wings paler. Body yellowish, thickly dusted with brown, and with purplish reflections. *Alar ex.* 1 1/4 inch. Kentucky. Larva unknown.

8. *D. obscurusella. N. sp.*

Palpi and antennæ dark brown, the palpi with a little ochreous intermixed, and with the second joint ochreous on the inner surface; face pale ochreous, sparsely flecked with pale fuscous; thorax and anterior

wings dark brown, mixed almost equally with ochreous, and with a few scattered white scales. In some parts of the wings the dark brown scales are condensed into irregular, wavy, rather indistinct lines or narrow bands, one of which is placed at about the basal one-fourth of the costa, and is oblique and furcate, sending one of the branches nearly to the end of the disc; at about the apical one-third they are again condensed into an indistinct zigzag line across the wing, and again into a brown irregular patch at the apex. Sometimes in fresh specimens these zigzag lines and spots in the apical part of the wing appear to be continuous; but they are indistinct, and when the wing is a little rubbed, they appear as very indistinct separate lines or spots. Ciliæ dark fulvous, sprinkled with dark brown; posterior wings pale grayish fuscous, becoming darker towards the tip. *Alar ex.* 5/8 inch. Kentucky. Larva unknown. Also in the collection of Mr. Wm. Saunders, London, Ont.

♀. *D. pseudacaciella. N. sp.*

Antennæ and palpi dark purplish-brown, streaked and flecked with white. Head clothed with dark brown and white scales about equally, tinged with pale purplish. Thorax and anterior wings dark purplish-brown, streaked and flecked with white and ochreous especially; a streak extending from the base nearly to the apex, just within the costal margin of which the prevailing hue is ochreous, mixed with white. A white costal spot at the beginning of the costal ciliæ, and an opposite dorsal one, both small. Ciliæ grayish silvery, with a rather distinct and wide hinder marginal line at their base dark brown. Hind wings pale ochreous-brown. Body and legs dark purplish-brown, with a nearly equal intermixture of white scales. *Alar ex.* nearly ¾ inch. Very common in Kentucky.

Dr. Packard (*Guide, p. 349*) mentions another species, *D. robiniella*, which seems to be very distinct from this, but which, like this, feeds upon the leaves of the Locust (*Robinia pseudacacia*). The larva of this species, when young, inhabits the mines of *Lithocolletis robiniella*, Clem., and *L. ornatella, Mihi*, in the leaves of *R. pseudacacia* and *R. hispida*. When older, it sews together the leaflets, and lives between them. I once saw one cut its way into the mines of *L. robiniella*, proving thus that its frequent presence in those mines was not owing to its having accidentally wandered into torn mines.

The young larva is green, with darker green longitudinal markings, with the head and next segment shining black, and mouth ferruginous.

When older, it becomes pale green, with two dark brown longitudinal stripes on top of the third and following segments, with a row of dark brown spots on each side of each line, and a black longitudinal line on each side.

10. *D. bimaculella. N. sp.*

Palpi, head, thorax and forewings shining dark purplish-brown or black. Extreme tip of palpi yellowish-white; there is a large white spot on the disc just beyond the middle, and a white spot or streak which starts from the beginning of the costal ciliæ, but does not attain the dorsal margin. Ciliæ fuscous. Abdomen pale fuscous, each segment of the venter tipped with white. *Alar ex.* ½ inch. Kentucky. Common. Larva unknown.

11. *D. cercerisella. N. sp.*

Palpi white, except the third joint, which is dark brown from the apex nearly to the base. Face, head, and anterior margin of the thorax, white. Antennæ dark brown, faintly serrated towards the apex. Thorax and anterior wings shining, soft, velvety black, dusted with a few ochreous scales which, in some lights, give it a bronzy hue. Three large snow-white costal spots, the first of which is the largest, extending to the fold; the second is about the costal middle, and the third at the beginning of the ciliæ. A white dorsal spot opposite the third costal, and about four small white spots forming a row around the apex; costo-apical ciliæ short, dark brown; dorso-apical ones longer and silvery white; a dark brown hinder marginal line at the base of the ciliæ. Posterior wings scarcely emarginate beneath the tip, pale drab, faintly tinged with pink. *Alar ex.* ½ to ⅝ inch.

The larva is very pretty. When young, it is snowy white; when old, the basal half of each segment, above, is pearly white, and the posterior half shining black, with a shining black band across the head in front of the eyes, interrupted in the middle, and a transverse bow-shaped shining black streak on the vertex. The true feet are shining black. This is one of the few instances among the *Tineina* where the colours of the imago are indicated by those of the larva. It feeds upon the leaves of the Red Bud *(Cercis Canadensis)*, which it either folds or sews together. It is exceedingly abundant in the larval state, but is much infested by an ichneumonide parasite, so that I have been able to rear but a single specimen, and have captured another.

LIST OF THE WRITINGS OF THE LATE

COLEMAN TOWNSEND ROBINSON.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

I give here a list of those of the Entomological writings of my late esteemed friend, Mr. Coleman T. Robinson, that have been published under his sole signature.

These recommend themselves to the attention of the student by their conscientious statement and adequate illustration of the different species they discuss. They were all written subsequent to Mr. Robinson's return in 1868, from a journey to England and Continental Europe, during the prosecution of which a representative collection of European *Lepidoptera* was acquired, and especial attention was paid to the smaller moths. Mr. Robinson saw and talked with Zeller, whose researches and studies on the Micro-Lepidoptera have furnished the basis on which our best authors have founded their classifications. He could not fail to be benefitted by such contact, and I know he carried with him to his early grave a sweet recollection of the old Professor who had honored him with his good fatherly counsel and even affectionate consideration. Five papers, under the common title of Descriptions of North American Lepidoptera, and illustrated by 86 figures, have been already published under the joint authorship of Mr. Robinson and myself in the Transactions of the American Entomological Society. The sixth and last paper, bringing, according to our original agreement, the number of illustrations to one hundred, and with a revisionary supplement, is in great part completed. The collection on which these and all our other joint entomological writings were based, is now in the possession of the American Entomological Society. Sometime I hope to be able to publish this Sixth Paper, and bring to a conclusion our joint plan and labors. How deeply do I feel the loss of my clear-headed, talented friend and coadjutor!

I.—LEPIDOPTEROLOGICAL MISCELLANIES. Annals of the Lyceum of Natural History, February 1st, 1869, pp. 152 to 158, Vol. IX., and Reprint, with one coloured plate.

In this Paper the following species are described and illustrated:—

Euphanessa mendica, Packard, p. 152, plate 1, fig. 1.

Euphanessa unicolor, Robinson, p. 153, plate 1, fig. 2.

I am inclined to refer this Texan species to Walker's genus *Ameria;* to which also *Crocota cupraria*, Walk., belongs.

Oligostigma albalis, Robinson, p. 153, plate 1, fig. 3.

Cataclysta bifascialis, Robinson, p. 154, plate 1, fig. 4. A Texan species allied to *C. opulentalis*, Lederer.

Eromene texana, Robinson, p. 155, plate 1, fig. 5. Our only described North American species, and allied to Zeller's *E. ramburiella.*

Depressaria cinereocostella, Clemens, p. 155, plate 1, fig. 6.

Depressaria atrodorsella, Clemens, p. 156, plate 1, fig. 7.

Depressaria pulvipennella, Clemens, p. 157, plate 1, fig. 8.

Depressaria lecontella, Clemens, p. 157, plate 1, fig. 9.

Depressaria grotella, Robinson, p. 157, plate 1, fig. 10.

In thus illustrating the closely allied species of this Tineid genius, Mr. Robinson has performed a very useful task.

II.—Notes on American Tortricidæ. Transactions of the American Entomological Society, Vol. 2, February, 1869, pp. 261—288, with six lithographic plates containing eighty-six illustrations.

B. The same reprinted; a pamphlet of 27 pages, with the plates coloured.

With this article Mr. Robinson commenced his labours on the *Tortricidæ.* Forty-five species of the genus *Tortrix* are described and figured, twenty-three of which are noticed for the first time, one re-named, and fifteen referred here from the other genera. Fourteen species of the genus *Teras* are described and figured, nine for the first time, three referred here from other genera, one European species recognized as occurring in this country. Finally, twelve species of *Conchylis* are also described and illustrated. Of these, three belonging to that section of the genus which contains the silver-spotted species, are newly described; of the remainder, seven are first noticed in this paper, and two for the first time referred to this genus.

III.—List of North American Tortricidæ. Part 1. New York Printing Company, October, 1869.

IV.—Lepidopterological Miscellanies, No. 2. Annals of the New York Lyceum of Natural History, Vol. IX., December, 1869, pp. 310 to 316, and Reprint.

In this paper are described the following species:—

Hypena internalis, Robinson, p. 311. This species is now known as *Hypena torenta*, Grote; the name used by Mr. Robinson is preoccupied.

Hypena evanidalis, Robinson, p. 311. This species is allied to *H. humuli*, Harris, and has probably been confounded with it. In a paper on the North American species of the genus in MSS., the differences are pointed out.

Schoenobius sordidellus, Zeller, p. 31.

Schoenobius longirostrellus, Zeller, p. 312.

Schoenobius melinellus, Robinson, p. 313.

Schoenobius clemensellus, Robinson, p. 313. This is *Chilo aquilellus*, Clemens, but the name had been previously used.

Schoenobius dispersellus, Robinson, p. 313.

Schoenobius unipunctellus, Robinson, p. 314.

Schoenobius tripunctellus, Robinson, p. 314.

Crambus minimellus, Robinson, p. 315.

Crambus satrapellus, Zeller, p. 315.

Crambus bipunctellus, Zeller, p. 316.

So far as known to me, the above list contains mention of all the writings for which the late President of the American Entomological Society was alone responsible.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 96.)

238. PACHYTA LITURATA *Kirby*.—Length of body 7-9 lines. Several specimens taken in Lat. 54° and 65°.

[179.] This is the American representative of *P. quadrimaculata*, from which it differs principally in being not so hairy, with hoary instead of yellow-tinted hairs: the punctures of the prothorax and elytra are more minute; the antennae are rather shorter, and the elytra, instead of two subquadrangular black spots, have three less black linear ones, the two anterior ones being partly parallel, and in some specimens confluent.

GENUS LEPTURA, *Linn.*

This genus may be thus subdivided with respect to the species about to be described.

* Eyes emarginate, or kidney-shaped.
† Elytra triangular.
a ——— truncated ..... } at the apex.
b ——— premorse, or with a sinus taken out }
1 ——————— prothorax anteriorly constricted without posterior angles.
2 ——————————— not constricted, posterior angles acute.
c ———rounded ..... at the apex.
†† Elytra linear.
a ——— truncated } at the apex.
b ——— rounded }
** Eyes entire.

* † a

239. LEPTURA CHRYSOCOMA *Kirby*.—Plate v., fig. 1. Length of body 5½—6¼ lines.

Several specimens taken; the largest, in the journey from New York; the smaller, near Cumberland-house. Taken likewise by Dr. MacCulloch and Capt. Hall, in Nova Scotia.

[180.] This beautiful insect is related to *L. virens*, but perfectly distinct. The body appears to be black, but that colour is, in most parts, nearly concealed by a thick and mostly long coat of brilliant golden hairs with a very slight tint of green, where the coat is thin the body appears minutely punctured. Head subelongated, the neck exserted, subtriangular; nose with only a few scattered whitish hairs; antennæ black, third, fourth, and fifth joints rather slenderer and longer than the succeeding ones: prothorax between globose and bell-shaped, constricted anteriorly, channelled, grossly punctured: substance of the elytra pale testaceous, towards the apex externally they are dusky; the golden down on them is shorter and decumbent; apex diverging and obliquely truncated: underside of the abdomen particularly brilliant from decumbent hairs: legs less hairy than the rest of the body. [Taken from New York to Lake Superior, but not common. More frequently taken in the neighbourhood of Quebec.]

240. LEPTURA SUBPUBESCENS *Kirby*.—Length of body not noticed. Taken in Canada by Dr. Bigsby.

Body black, thinly coated with yellow hairs. Head and neck grossly punctured; antennæ longer than the prothorax, black, downy, intermediate joints rather slenderer than the others, fourth shorter than the fifth: prothorax shaped as in *C. chrysocoma*, widely but obsoletely chan-

nelled; rough and reticulated, as it were, with numerous confluent punctures, sides more hairy than the disk: elytra thickly punctured, pale testaceous, black at the apex, where the suture curves outwards so that they diverge from each other, extremity nearly transversely truncated: abdomen underneath minutely, breast rather grossly, punctured: podex subemarginate.

* + b 1.

241. LEPTURA ERYTHROPTERA *Kirby*. — Length of body 8 lines. Taken in Nova Scotia by Capt. Hall.

[181.] Body very black, slightly downy, underneath minutely punctured. Head shorter than in the last section, as well as the neck obsoletely channelled; thickly but not minutely punctured; antennæ rather longer than the prothorax; third and fourth joints a little slenderer than the others, and pale red at the base; the sixth is pale with a black spot on each side at the apex; and the whole of the eighth is of the same colour; the last joint is acuminated; the prothorax is constricted anteriorly, and the constricted part is perfectly smooth, the rest is thickly and confluently punctured and wrinkled; at the base the prothorax is depressed and obsoletely trilobed: scutellum black, representing an isosceles triangle: elytra of a dull red, grossly and deeply punctured; extremity scooped out with the external angle longer than the internal and acuminate: mesosternum emarginate posteriorly. [Taken in Canada on flowers in July; not common.]

242. LEPTURA CANADENSIS *Olivier*.—Length of body 6¾ to 8 lines. Taken in Nova Scotia by Dr. MacCulloch.

Body very black, slightly downy, minutely punctured. Head as in the last species, but the neck is not channelled; antennæ with base of the fifth joint, the whole of the sixth and eighth, except the black apex of the former, pale or pale rufous: prothorax as in *L. erythroptera*, only deeply and confluently punctured but not wrinkled: elytra black, sanguineous at the base. In other respects this species resembles that insect; the external angle of the apex of the elytra is however shorter. [Quite common from Georgia to Lake Superior.]

* + b 2.

243. LEPTURA TENUIOR *Kirby*.—Length of body 5¾ lines. Taken in Canada by Dr. Bigsby.

[182.] Body black, rather slender, slightly punctured, thinly coated with decumbent yellow hairs. Antennæ shorter than the body, fifth joint

scarcely longer than the fourth: prothorax between bell-shaped and a truncated cone, a little constricted in the middle, fringed with yellow hairs anteriorly and posteriorly: scutellum triangular: elytra testaceous, yellow at the base, and with three yellow bands, the first interrupted; oblique sinus at the apex not so deep as in the two preceding species: legs testaceous; abdomen of a deeper colour; and segments scarcely emarginate. This species differs in habit from the two preceding ones, it is narrower in proportion, and comes nearer to *L. quadrifasciata*, but the posterior angles of the prothorax, though acute, are not so prominent; it belongs however to the same subdivision, with the last mentioned insect. [Considered by Newman to be synonymous with *Strangalia fugax*.]

* † c.

244. LEPTURA BREVIS *Kirby*.—Length of body 5 lines. Taken in Canada by Dr. Bigsby.

Body shorter than usual in proportion to its width; black, underneath minutely punctured and thinly covered with rather silvery decumbent hairs. Head thickly and confluently punctured, rather downy with erect hoary hairs; antennæ shorter than the body; fourth, fifth, and sixth joints long and slenderer than the rest; six last short and pale at the base: prothorax between bell-shaped and globose, deeply and confluently punctured; downy with some erect hoary hairs; anteriorly constricted, posteriorly depressed: scutellum linear covered with pale decumbent hairs: elytra very grossly and deeply punctured, shorter than the abdomen and rounded at the apex, with a lateral band bent a little inwards towards the base, which it does not reach, of the colour of the yolk of an egg; anus entire: down on the legs yellow. [A variety of *L. vagans* Oliv. Taken in Canada, also in N. Y. and Penn.]

245. LEPTURA SEXMACULATA *Linn.*—Length of body 5½ lines. Two specimens taken in Lat. 65°.

[183.] Body rather short, black, downy, minutely punctured. Head very thickly and minutely punctured, obsoletely channelled; antennæ slender, shorter than the body, fifth joint considerably longer than the fourth: prothorax shaped as in the preceding species but less depressed posteriorly; very thickly as well as minutely punctured: scutellum triangular: elytra pale-yellow, with an arched black spot at the base, then follows an interrupted band consisting of three acute black spots placed in a triangle, beyond the middle is a dentated black band which reaches

neither the suture nor the lateral margin; the apex also, the suture, and the lateral margin towards the apex, are all black.

VARIETY B. Head not channelled: spot at the base of the elytra coalescing with the intermediate and lateral ones of the anterior band, and reaching the lateral margin; interior spot reaching the suture so as to form the half of a spot common to both elytra; the intermediate band is broader and reaches both the suture and lateral margin. [Belongs to *Strangalia (Pachyta)*. Taken at Quebec by Mr. Couper; Lake Superior by Agassiz's Expedition.]

* ++ a.

246. LEPTURA SEMIVITTATA *Kirby*.—Length of body 6 lines. Taken in Canada by Dr. Bigsby.

Body long and narrow, black, underneath slightly and minutely punctured, with the sides of the breast and abdomen brilliant with a silvery lustre from decumbent silky hairs, above glossy and almost naked. Head thickly punctured, but behind each eye there is a levigated space; antennæ longer than the prothorax, intermediate joints not slenderer than the others, the fourth as long as the fifth; neck short and levigated: prothorax bell-shaped, not constricted anteriorly, depressed posteriorly; thinly punctured, especially in the disk: scutellum triangular: elytra punctured but not thickly, punctures almost arranged in rows, towards the apex they are very slight; a reddish-yellow subflexuose stripe runs from the middle of the base of the elytra a little more than half way towards the apex, which is diverging and truncated: the ventral segments of the abdomen terminate in a reddish membrane. [Synonymous with *L. vittata* Oliv.; common in Canada on flowers during June and July; taken from Alabama northwards.]

[184.] 247. LEPTURA GULOSA *Kirby*.—Length of the body 5 lines. Taken in Nova Scotia by Dr. MacCulloch.

Very nearly related to the preceding species, from which it differs chiefly in being much smaller, in having the underside of the body more thickly covered with hairs glittering like silver; in having the throat pale-red; the fifth joint of the antennæ longer than the fourth; the punctures of the elytra more numerous and scattered; the yellow stripe running nearer to the apex of the elytra, dilated at the base and not flexuose: the fore-breast also in the disk, the after-breast on each side, and the base of the thighs are obscurely red: the tibiæ are piceous.

* †† b.

248. LEPTURA SUBARGENTATA *Kirby*.—Length of the body 4 lines. Taken in Lat. 65°.

Body narrow, entirely black, very minutely and thickly punctured, underneath glittering, but less conspicuously with silver pile; antennæ shorter than the body, nearly filiform, fourth and fifth joints of equal length; prothorax perfectly bell-shaped, anteriorly not constricted, posterior angles acute, diverging and covered with silver pile: elytra rounded at the apex. [Taken in Canada and Lake Superior.]

[185.] 249. LEPTURA SIMILIS *Kirby*.—Length of body 3⅓ lines. A single specimen taken in Lat. 65°.

This may possibly be the other sex of the preceding species which it resembles in every respect, except that the antennæ are rather longer, the scape or first joint, all but the base on the upper side, is rufous, as are likewise the thighs and four anterior tibiæ; the posterior thighs are however black at the apex.

250. LEPTURA LONGICORNIS *Kirby*.—Length of body 5 lines. A single specimen taken in Lat. 65°.

At first sight this species a good deal resembles *L. semivittata* and *gulosa* of the former section, but its eyes are entire, and its antennæ much slenderer and of a different type, more nearly resembling those of *L. argentata* and *similis*. Body black, minutely punctured, downy, especially underneath, with silvery hairs. Head minutely, thickly, and confluently punctured; labrum and base of the mandibles rufous; last joint of the palpi securiform; antennae very slender nearly as long as the body; scape incrassated, rufous, black at the base: prothorax a little constricted anteriorly, very thickly punctured with a longitudinal dorsal impunctured line or channel: scutellum longitudinally concave, rounded at the apex; elytra nearly linear, grossly punctured, glossy, nearly black, with a pale stripe extending from the middle of the base to near the apex, and gradually approaching the suture; apex subtruncated: legs rufous at the base. [Belongs to the genus *Acmæops* Lec.]

* *

[186.] 251. LEPTURA PROTEUS *Kirby*.—Length of body 3¼—5½ lines. Taken abundantly in Lat. 54° and 65°.

Body narrow, black, punctured, somewhat glossy, rather hairy, especially underneath, with decumbent hairs, those on the elytra have somewhat

of a golden lustre, the rest are silvery. Nose more grossly punctured than the rest of the head; vertex convex; eyes subovate, pale, with a slight golden lustre; antennae filiform, longer than the prothorax, obscurely rufous, with the four first joints black, fifth joint longer than the fourth: prothorax campanulate, anteriorly constricted, posterior angles a little diverging, thinly punctured; channelled, the channel running between two dorsal gibbosities: scutellum triangular: elytra rather widest at the base, and punctured there more grossly next the suture; diverging and truncated at the apex: tibiae piceous or rufo-piceous; four posterior thighs rufous at the base.

VARIETY B. In this variety only the base of the six last joints of the antennae is rufous, all the thighs are rufous at the base, and the tibiae of a clearer red, but they are dusky at the apex; tarsi rufous at the base. Length of the body 3¾ lines.

C. Elytra with a stripe at the base, tips and lateral margin rufous: antennae entirely black: legs as in variety B. Length of the body 4¾ lines.

D. Elytra with a longitudinal rufous stripe dilated at the base and apex; head of the lateral margin also rufous; antennae and legs nearly as in B, but the whole of the tarsi is obscurely rufous. Length of the body 3—4 lines.

E. Elytra rufous with the suture and a stripe near the margin abbreviated at both ends, dusky: antennae as in A; legs as in B. Length of the body 4—5 lines.

F. Elytra rufous, with a dusky suture; antennae as in A; legs as in D.

G. Like F, but elytra luteous: antennae all black. Length of the body 4 lines.

H. Like F and G, but legs and antennae black. Length of the body 3¾ lines.

L. Proteus seems to vary ad infinitum in the colour of the elytra, antennae, and legs, but as all the varieties agree in every respect except colour and size, and the elytra advance so gradually from pale rufous to black, or vice versa, there can be little doubt of the identity of the different varieties. [This very variable species is common throughout Canada. It belongs to the genus *Acmæops* Lec.]

[187.] 252. LEPTURA LONGICEPS *Kirby*.—Length of body 4 lines. Several specimens taken in Lat. 54° and 65°.

Like the preceding species but shorter in proportion with a longer head. Body black, punctured, hoary with rather silvery down: head as long or longer than the prothorax; eyes pale, subtriangular; antennae with the second, third and fourth joints slenderer than the rest: prothorax shaped as in *L. Proteus*, constricted before, depressed behind, but without diverging angles, channelled but with no gibbosity on each side the channel: elytra nearly linear, very thickly punctured, dirty-yellow, with a dusky lateral blotch extending from the base beyond the middle of the elytrum, suture and subtruncated apex black; down yellowish. [Belongs to *Acmæops* Lec.]

END OF CERAMBYCIDÆ.

OBITUARY.

We grieve to have to record the death of another devoted Entomologist, MR. COLEMAN T. ROBINSON, of New York, who expired, after a very brief illness, on the 1st of May last. Mr. Robinson was born in Putnam County, N. Y., in 1838, and had but recently completed the 35th year of his age. When quite a young man, he made a prolonged tour through Europe, Egypt and the Holy Land, and spent some time at the University of Berlin. On his return to New York, in 1861, he engaged in business as a stock broker in Wall Street, and soon became the head of a very successful and enterprising firm, Messrs. Robinson, Cox & Co. So shrewd and successful were his speculations that in a few years he amassed a large fortune, and on his retirement from business a couple of years ago, he was reputed to be worth about a million and a half of dollars. Latterly he resided near Brewster's Station, on the New York and Haarlem Railway, where he had purchased a handsome country seat. Notwithstanding his devotion to business of so engrossing and exciting a character, he yet found time to indulge in his favorite study of Entomology, and in connection with his friend, Mr. Grote, described a large number of new species of North American Lepidoptera, chiefly belonging to the families of Sphingidæ, Bombycidæ, Noctuadæ and Tortricidæ. A list of his published papers, prepared by his coadjutor, Mr. Grote, is given on another page. We are glad to learn that amongst his other bequests, Mr. Robinson left the handsome sum of $10,000 to the Buffalo Society of Natural Sciences, with which he was connected for several years.

MISCELLANEOUS NOTES.

A NEW DEPARTURE.—We invite especial attention to the card of that talented and well known Entomologist, MR. FRANCIS GREGORY SANBORN. We heartily congratulate our esteemed confrere on the stand he has taken on the behalf of Practical Entomologists. Mr. Sanborn is thoroughly qualified, from his scientific attainments and personal reputation, to take this step, and we sincerely trust a new era may be dawning for Entomological Science, in which the professional skill of competent scientists may receive an equal share of recognition with that of members of the various other learned professions. We feel, however, quite satisfied that while Mr. Sanborn has laid down his terms of consultation, he will always be ready, as heretofore, to afford any information to brother Entomologists, or to students struggling to overcome the difficulties of the science.—[*Editor C. E.*]

STRANGALIA LUTEICORNIS.—On one of the last days of July, 1871, as I emerged from the woods which cover the eastern end of Bishop's Island—one of the most romantically situated of the Thousand Isles—I came upon a sunny glade, and in it stood a flowering shrub, (the name of which I do not know,) in full bloom. The blossoms were thronged with the insect hosts—well nigh all orders being represented in sufficient variety to stock a fair-sized entomological cabinet. My attention was most attracted to the Coleoptera, from the great numbers of *Typocerus fugax* and some few specimens of *Strangalia luteicornis*. The latter, from the extreme narrowness of their bodies and elytra, as well as from their markings, were very noticeable ; they were also particularly active, running over the flowers, taking to flight, or dropping down among the leaves in a way that almost defied capture. I, however, succeeded in taking one ; and learning from a great authority in such matters, that though well known in Pennslyvania, it has not, as yet, been included among the natives of this Province, I make this note of the fact of my capture.—R. V. ROGERS, Kingston.

NOTES AND QUERIES.—*Trichius Bigsbii.*—*Gnorimus maculosus*, Burmeister, Knoch. This insect seems to be very rare in this part of Canada. During nearly thirty years collecting, I have found only one specimen, taken at Drummondville, in the Niagara District. Other collections seem to have been equally unfortunate.

Pelidnota punctata.—Common about London and Niagara ; has never to my knowledge, been found near Toronto.

Desmocerus cyaneus.—About 25 years ago, I took a colony of about 30 specimens off some elder bushes in rear of Trinity College. I have never met with another specimen near Toronto, one I found in fall of 1870 at the Sault St. Marie.

Calosoma scrutator.—Of this magnificent insect, many dead specimens may be collected on the south shore of our Toronto peninsula after a southerly wind, but I have collected but two living specimens on this side of the lake.

QUERY.—Is it known that any of the large *Carabidæ* are capable of ejecting an acid liquid like the *Bombardiers?* The following anecdote may prehaps be worth embalming in the CANADIAN ENTOMOLOGIST:—In the fall of 1839, I was wandering with a friend over the rocks at Thurand, near Dresden, and found a magnificent *Carabus*, about an inch long, probably *Auratus* or *Aurenitens*. Examining it, the beast exploded, and shot me in the eye. The pain was so intense, lasting for full a quarter of an hour, that, notwithstanding my Entomological proclivities, the insect was allowed to escape.

QUERY.—Can any of your correspondents refer me to a paper on the sugar from the "Mexican Honey Ant?" I have seen it, but cannot recall where. On mentioning this to my late lamented friend, Mr. Williamson, who was for years engaged on railway construction in Mexico, he informed me that the Indians were often in the habit of knocking down ants' nests from the boughs of trees, and extracting honey from the interior; this honey having been formed, not by the ants, who build the suspended nests, but by a species of bee (he called them Sweat Bees), which constructed their comb in the centre of the ants' nest. I should be glad to obtain any information of my late friends statement.—H. H. CROFT, Toronto.

ADVERTISEMENTS.

EXOTIC LEPIDOPTERA AND COLEOPTERA.—I have a large collection of specimens of *Lepidoptera* and *Coleoptera* from Australia, Manilla, Mexico, and Central America, which I am now arranging for the purpose of sale, as I intend confining myself to Californian insects for the future. I will not exclude from the offered sale my numerous Californian specimens. I will continue to collect in all branches of the Californian entomological fauna, and I invite exchange. I have also a complete set of the Pacific Railroad Survey Reports (13 volumes), in excellent condition, which I shall be glad to dispose of. Apply to JAMES BEHRENS, San Francisco California.

The Canadian Entomologist.

VOL. IV. LONDON, ONT., JULY, 1872. No. 7

NOTES ON ARGYNNIS CYBELE.

BY W. SAUNDERS, LONDON, ONT.

On the 7th of June, while turning over some loose rails lying on a moist piece of ground, near the edge of a wood, I found attached to the underside of one of the rails, lying high and dry, two spinous larvæ, which, from their appearance and location, I at once suspected to be the larvae of some species of *Argynnis*. The Wild Violet also, the food plant of at least several of this family, growing in abundance here, helped to confirm my suppositions. These afterwards proved to be the larvae of *Argynnis cybele*. Both larvae were in the act of spinning a small web of silk, to which their terminal prolegs were attached, indicating that the change to the chrysalis state would soon take place. The following description was at once taken :—

Length 1.70 inches. Body thickest along the middle segments, tapering a little at each end, coils itself up when disturbed.

Head medium sized, flat in front, slightly bilobed, each lobe tipped above with a short tubercle, from which arises a moderately long black hair; colour black in front, edged posteriorly above, and half way down the sides with dull brownish-yellow. On the front there are many fine black hairs of varying lengths.

Body above black, with a faint tinge of reddish brown, armed with a transverse row of branching spines on each segment. On the second segment there is a branching spine on each side the dorsal line all black, and another pair on sides between the second and third segments, black above, brownish-yellow at base. On the third segment there are four spines similarly situated, that is, one sub-dorsal pair, and another pair lower down, and placed between the third and fourth segments, all black above, brownish-yellow at base. On the fourth segment there is one pair of spines only, the sub-dorsal. From the fifth to the twelfth segments inclusive, each is alike ornamented with a transverse row of six branching spines, those on each side the dorsal line entirely black, or

with but a slightly paler shade at base ; the next row lower down black above, with a small portion of their base brownish-yellow, excepting on the twelfth segment, where they are all black; but in the next row below, the spines have a larger portion of their base brownish-yellow, with a small space around the base of each where the same colour prevails. Terminal segment with two pairs of black branching spines, one pair placed behind the other, the hindermost being a little the shortest. On the sides of each of the anterior segments, below the spines, there are several shining black tubercles, each emitting a small cluster of short black hairs. Spiracles oval, black, edged with a paler shade.

Under surface dull dark reddish-brown. The fifth, sixth, eleventh and twelfth segments each have a transverse row of shining tubercles, emitting tufts of short black hairs ; feet black, prolegs have a patch of black on the outside at their base, reddish-brown above, and within.

Before turning to chrysalis, the colour at the base of the spines changed from brownish-yellow to a semi-transparent greenish hue.

One specimen hung itself up June 9, and became a chrysalis June 10. From the first, the chrysalis is very dark coloured. The following description was taken a few days after the change was effected :—

Chrysalis.—Length 1.30 inches. Colour brown, spotted and streaked with black, the whole surface having a polished appearance as if it had been varnished. Head case square above, the flat portion terminating on each side in a slightly raised blackish tubercle ; a dark line extends across from one tubercle to the other, bordered in front and behind with yellowish brown. A double ventral row of dark brown or blackish tubercles, one pair on each segment ; below these there is a second row of smaller tubercles of a paler colour along the middle segments, just above the spiracles. At the base of the wing cases is a pointed projection. Anterior segments raised to a sharp ridge, and the ventral edge of the wing cases have a similar ridge along the basal portion. Antennae cases dark brown ; spiracles oval black. Dorsal region of posterior segments dark brown, nearly black.

On visiting the same locality on the 9th of June, three chrysalides were found on the under side of pieces of bark which had been peeled off a dead tree, and were lying scattered about. The pupae were found attached to those pieces which were lying with their convex side upwards, thus affording a dry and sheltered spot under for the larvae to attach themselves to. I then collected a number of such pieces of bark,

and laid them about in this manner in spots where the Wild Violets grew thickest, and on my return two or three days after, found six more chrysalides, and another larva just about to change. I feel assured that with such traps as these laid about in places where they are feeding, any one may secure specimens of these larvæ without trouble during the first week or ten days in June. I have never succeeded in finding them otherwise, although I have searched long and often. One of the chrysalides produced the imago on the 26th, another on the 27th of June, and others at intervals between the 27th of June, and the 4th of July. The specimen which changed to a chrysalid on the 10th of June produced the imago on the 29th, but this was kept in a cool room all the time, and was hence probably longer in perfecting than it would have been if exposed to the warming influence of the summer's sun. I should judge the ordinary duration of the chrysalis state, when left in their native haunts, to be from fourteen to sixteen days. All the specimens bred proved to be *Argynnis cybele*.

ON SOME

LEAF-MINING COLEOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

It is necessary for me to correct a serious error into which I have fallen.

At page 165, v. 3, I have described a larva mining the upper surface of leaves of the White Oak (*Quercus alba*), which seemed to me to answer the requirements of Dr. Clemens' *Lithocolletis tubiferella*, which also mines the leaves of *Quercus alba*. The larva was not removed from the mine, but viewed through the integument. It seemed to me to resemble greatly, if it was not identical with, Dr. Clemens' species. The mine answered, in every respect, to that described by Dr. Clemens. At the same time I remarked the peculiar appearance of the larva, which "differs from the ordinary flat *Lithocolletis* larva as much as that does from the larva of the first or cylindrical group." In fact I should never have suspected it to be a *Lithocolletis* larva but for the resemblance, both of the mine and larva, to that of *L. tubiferella*, as described by Dr. Clemens. I did not succeed in rearing the imago, and do not know

what it would have produced. On the next page (166, v. 3), I mentioned a larva precisely like it, but in a different blotch mine, inhabiting the leaves of Willow Oaks, and another in leaves of the Black Oak, still another in the leaves of the Beech, another in the Sugar Maple, and yet another in the leaves of a species of *Desmodium*. Viewed through the integument, all of these larvæ, except the *Desmodium* miner, resembled the supposed larva of *L. tubiferella*. The miners of the Beech and Sugar Maple leaves appeared to be identical with each other and with the supposed *L. tubiferella*, but their mines differed from it, and resembled those in the leaves of the Black and Willow Oak in being more irregular blotches. The miners of the Black and Willow Oaks differed from the others by being of a bluish or smoky colour instead of yellowish-white. The miner of the *Desmodium* differed from the others in shape resembling the larva of *Leucanthiza*, as described by Dr. Clemens. But the mine and cocoon (or rather *nidus*), are indistinguishable from those of *Lithocolletis guttifinitella* Clem. and allied species of *Lithocolletis*. *These larvæ are all Coleopterous!* They remained in the mines without food from September to the latter part of April. All died except the miners of the Beech (*Fagus ferruginea*) and of the *Desmodium*. In the latter part of April these became pupæ, remaining in that condition for ten days, when the imagines emerged. The miner of the Beech proved to be *Brachys aeruginosa*, Say, as identified by Dr. Horn, as I am informed by Mr. Wm. Saunders.

The miner of the *Desmodium* proved to be *Metonius laevigatus*, Say, as identified by Mr. Johnson Pettit, of Grimsby, Ont. The larva of the *Brachys* resembles that of *Chrysobothris femorata*, as figured in Packard's Guide, p. 457, more nearly than that of *Trachys pygmea*, figured on p. 458. The head is rounded in front; the first segment is much the largest, and the larva tapers rapidly thence to the fourth segment, and thence more gradually to the apex. The larva of *Metonius laevigatus* is flattened, and is rather widest about the middle, tapering, however, more rapidly to the tail than towards the head; the first segment is largest, and the head rounded in front. It resembles the larva of *Trachys* in outline more than that of *Chrysobothris*. In examining dead specimens of all these larvæ removed from the mines this spring, I was not able to detect any trace of feet.

I have no excuse to plead for this error other than the facts above stated, and ignorance of Coleopterous larvæ.

Hispa quadrata, Fabr. mines the leaves of the Linden (*Tilia Americana*).

Hispa inaequalis, Weber, mines the leaves of *Eupatorium ageratoides*.

Both species pupate in the mine. Both identified by Dr. Horn.

DESCRIPTIONS OF

GELECHIA ADUNCELLA AND GELECHIA LABRADORICA.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

In a very interesting paper published by Professor Zeller in the Transactions of the Royal Imperial Zoological Botanical Society of Vienna, under the date of July, 1868, I find the description of a North American *Gelechia*. The specimens were communicated to Prof. Zeller by Baron V. Osten-Sacken. I give here a free translation of Professor Zeller's comparative description :—

Gelechia aderucella, Zeller.—Allied to *G. ligulella*. The yellowish-white transverse line of the primaries, which becomes pure white on the costal edge, is removed farther towards the hind margin of the wing. It is strongly bent below costa towards the apices, and a little widened, is continued on the costal edge outwardly. The ground colour of the base is greyish-brown, so pale in hue as to allow the three black dots (two on the fold, one obliquely over the last of these outwardly at the middle of the wing), to be more or less distinctly perceivable, whereas in *G. ligulella* and *vorticella* no dots are visible on the black ground colour of the wing. This greyish-brown tint deepens, beyond the outer two dots, gradually into the broad black shade which margins the transverse line. The fringes of the secondaries are pale grey, becoming paler outwardly, and are even at base paler than the external portion of the wing itself. Beneath, the forewings exhibit beyond the middle, and in a corresponding position with the superior end of the transverse line of the upper surface, a rather distinct white spot. In size this species agrees with an average specimen of *G. ligulella*.

In the *Wiener Entomologische Monatschrift* for June, 1864, p. 200, I find a description, of which I give here a translation, of a species of *Gelechia* from Labrador, by Mr. H. B. Moeschler :—

Gelechia labradorica, Moeschler.—♂—Antennæ greyish-yellow with

whitish-yellow annuli, palpi greyish-yellow, terminal joint pale yellowish, feet, head, thorax and abdomen greyish-yellow. Forewings of a darker greyish-yellow, subcostal nervules darker, brownish. Hindwings whitish-grey, a narrow dark marginal line. Beneath, the forewings are brownish-grey, with a narrow yellow marginal line.

Expanse 22 mil.

This inconspicuous species is illustrated on plate 5, at figure 17.

On the same page is recorded the occurrence of Gelechia *continuella* in Labrador.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 108.

DEPRESSARIA.

D. pallidochrella. N. sp.

Head and palpi very pale ochreous, almost white, a little darker on top, a dark brown spot extends almost entirely around the base of the third joint of the palpi, and another entirely around it before the apex. Antennae brownish, with about six white annulations in the apical part. Thorax and base of the wings pale ochreous, sparsely dusted with fuscous, with a fuscous line across the wing close to the base. About the basal one-fourth of the wing a fuscous streak passes obliquely backwards as far as the fold, and from thence to the apex the wing is pale ochreous, rather thickly dusted with fuscous and dark ochreous, with the extreme apex fuscous. Posterior wings pale fuscous; ciliae of all the wings grayish-ochreous; abdomen dark ochreous, each segment above tipped with very pale or whitish ochreous. Under surface very pale ochreous, with fuscous patches on the anterior surfaces of the meso and meto-thoracic legs. Anterior legs dark brown on their anterior surfaces. *Alar ex.* less than ⅝ of an inch. Captured in May in Kentucky.

The posterior wings in this species are deeply emarginate beneath the apex; this and the succeeding species which resemble each other being the only two described American species which display this character. This species may be distinguished from the next by its smaller size, paler color, and the brown tip of the forewings.

D. versicolorella. N. sp.

Head and palpi ochreous, thickly dusted with brown; a brown annulus around the base of the third joint of the palpi, and another before the apex. Antennae dark brown, faintly annulate with ochreous, and with five or six white annulations in the apical portion. Thorax and anterior wings ochreous, thickly dusted with dark brown; a little less thickly in the basal fourth of the wing, with a brown streak across the base of the wing, and a brown streak extending obliquely from the costa about the basal fourth, to the fold, which, however, is scarcely distinguishable from the thickly dusted portion of the wing behind it; no brown spot at the apex. Posterior wings pale fuscous: abdomen ochreous, the segments not margined with whitish, as in the preceding species. *Alar ex.* ⅞ of an inch. Captured in Kentucky in May.

D. bicosto-maculella. N. sp.

Head pale yellowish, the vertex dusted with fuscous; antennae dark brown; second joint of the palpi pale yellowish, tipped with brown beneath; third joint brown, sprinkled above with pale yellowish: thorax and anterior wings blackish, or very dark brown, with ochreous and gray intermixed, with a small and indistinct ochreous spot on the costa, near the base, and another distinct costalous at the beginning of the ciliae, and an opposite dorsal one; ciliae yellowish-ochreous. There are several rather undefined irregular blackish spots or patches on the wings, which, *to the naked eye*, appear to form three irregular transverse bands, not very definite in outline, one of which adjoins each of the costal ochreous spots, whilst the other is between them. *Alar ex.* ⅞ inch. Kentucky.

D. querciella. N. sp.

This species is a *Depressaria* in every respect except that *there is a small but very distinct tuft of erect scales at the apex of the thorax.* I have but a single specimen, which, however, is in perfect condition, and shows no sign of any injury, so that I cannot doubt that the tuft is a normal structure.

Antennae dark brown or rather blackish, annulate with white; palpi iron gray; head silvery, flecked with dark brown or blackish scales; thorax iron gray, the tuft being ochreous; anterior wings dark iron gray, with a distinct small blackish spot on the costa at about the basal fourth, and two other smaller ones on the costa, one about the middle, and the other at the beginning of the apical ciliae; there are three or four similar small ones on the disc; ciliae ochreous; posterior wings pale

slate colour, and the abdomen is yet paler. The entire insect, in some lights, shows purplish reflections. Under the lens, the iron gray colour is resolved into blackish or dark brown, mixed with ochreous and whitish scales. *Alar ex.* 1⅛ inch.

The larva has the head and first segment dark purplish-brown, except the anterior margin of the first segment, which is whitish. Remaining segments whitish, with two longitudinal narrow pale purplish lines on top, outside of which, on each side, is a wider deep purple one; there is also a multitude of small purple spots, from each of which proceeds a hair. It sews together leaves of the Oak *(Quercus obtusiloba)* in May, and remains in the pupa state about ten days, the imago appearing early in June.

The two preceding species and *D. obscurusella*, *ante*, *p. 106*, and *D. bistrigella*, *ante*, *p. 92*, resemble each other very closely. *D. obscurusella* is more ochreous than the others, and the markings assume the form rather of narrow irregular and zig-zag lines, although, on close inspection, three dark costal spots may be discovered as in *querciella*, but less distinct. *D. bicostomaculella* is smaller than the others, and the three costal blackish spots have, in it, become to the naked eye three irregular bands, narrowing towards the dorsal margin. I have no specimen of *D. bistrigella* now before me, but I think it can be distinguished by the more linear shape of the ochreous streaks before the ciliae, and by the two small ochreous patches about the middle of the wing. *D. querciella* may, however, be more readily distinguished by the thoracic tuft.

As the species of *Depressaria* described in this and the preceding No. differ somewhat, structurally, it is possible that some of them ought not, in strictness, to be placed in this genus. Yet they approach it more nearly than any other. The following notes will explain their similitudes and differences:-

D. dubitella has the second joint of the palpi much thickened, forming a small *undivided* brush; the superior portion of the discal vein is very oblique, and the superior branch is united to the subcostal at the end of the cell. The abdomen in my single specimen is broken off. It does not belong strictly in *Depressaria*.

D. albisparsella has the palpi of *Depressaria*, but the brush is very large; the wings in my single specimen are closed so that I cannot observe the neuration. The antennae are minutely but distinctly pectinated, more so than in the true *Depressaria*.

D. cercerisella and *D. bimaculella* resemble each other in the ornamentation as well as structure. The abdomen is subdepressed, the palpal brush is small and undivided, except at the apex. The neuration is that of *Depressaria* proper, though the superior and inferior branches of the discal nervure respectively, originate a little nearer to the subcostal and median than is usual in true *Depressaria*.

D. pseudacaciella has the abdomen subdepressed, scarcely tufted, and the superior branch of the discal vein arises very near to the subcostal; otherwise, it is a true *Depressaria*.

D. fusco-ochrella has the abdomen and palpi of *Depressaria*, but the neuration of the hind wings is like that of some species of *Gelechia*; that is, the superior branch of the discal vein is absent, and the subcostal is furcate behind the cell. *D. bicostomaculella*, *D. Rileyella*, *D. obscurusella*, *D. Versicolorella*, and *D. pallidochrella*, are true *Depressariæ*, I believe, though the abdomen in my single specimen of *D. obscurusella* is missing. *D. pallidochrella* and *D. versicolorella* are very deeply emarginate beneath the apex of the hind wings. *D. querciella* has the small thoracic tuft, but is otherwise a true *Depressaria*.

All of the foregoing species agree in the neuration of the anterior wings, and all have the *Depressaria* habits of seeking concealment, and of sliding about upon their backs in their efforts to escape.

HAGNO, *gen. nov.*

At *ante p. 91*, I have described a species as *Depressaria cryptolechiella*, and have there pointed out the differences between it and the true *Depressariæ*. Indeed, it is scarcely more nearly allied to *Depressaria* than to several other genera; but having then but a single specimen of that species, and none of any other species allied to it more closely than the species of *Depressaria*, I preferred to place it provisionally in that genus. Since then, however, I have bred the species mentioned below, and not wishing to encumber that genus (already large) with any thing which does not rightly belong there, and, not knowing what else to do with these species, I have concluded to erect for them this new genus.

Head and face slightly roughened. Antennæ more than half as long as the wings; face rather narrow; eyes large, globose; tongue scaled, longer than the anterior coxæ; maxillary palpi minute; labial palpi very long, completely overarching the vertex, second joint without a brush, third joint accuminate, about two-thirds as long as the second.

Posterior wing not emarginate beneath the apex, wider than the anterior, the costal margin nearly straight, the dorsal regularly curved. The discal cell is closed: the costal vein attains the margin just before the apex; the sub-costal at the apex; the median sends a branch to the posterior margin before the discal vein, and becomes furcate at the discal vein, delivering both branches to the posterior margin. The discal vein is slightly oblique, and sends two branches to the dorsal margin; internal vein, simple.

Anterior wings *widest near the apex;* costal margin a little convex, dorsal margin nearly straight, apical margin obliquely curved, and apex obtusely rounded. Discal cell closed; costal vein attains the margin about the middle, and the sub-costal attains it before the apex, giving off one branch before the discal vein; the median rounds gradually into the discal, sending, near the discal, two long curved branches to the dorso-apical margin; and the discal sends off four veins, the superior of which is furcate, delivering one of its branches to the apex, and the other to the costal margin before the apex; the three other branches of the discal are delivered to the apical margin behind the apex; the sub-median is furcate at the base; the internal is wanting, and the fold is very distinct. The neuration is, therefore, that of *Depressaria.* The abdomen is also slightly depressed, though not so much as in *Depressaria;* and it seems to differ from that genus only in having the palpi more elongate, and without any brush, and in its wider wings, which are more obtusely rounded at the apex. It is certainly not equivalent to either *Exæretia* or *Ortholelia,* but possibly may be equivalent to *Cryptolechia,* which, however, has not the depressed abdomen.

Can this genus be the equivalent of *Psilocorsis,* Clem.? *(Proc. Acad. Nat. Sci., Phila., 1860, p. 212).* It meets all the requirements of Dr. Clemens' diagnosis, *except as to the form and neuration of the fore wings.* Not only so, but what I have called *the pattern* of coloration is the same in my species as in those described by Dr. Clemens, especially as to the peculiar markings of the antennae and palpi; and even the very shades of colour are the same to a great extent. I have not seen any of Dr. Clemens' species, and can only compare mine with his written descriptions. The striking resemblance between my species of *Hagno* and those of *Psilocorsis,* as described by Dr. Clemens, did not attract my attention until after the preceding portion of this paper was in the hands of the printer, for, on comparing the fore wing of *H. faginella* with a

sketch of that of *Psilocorsis*, as described by Dr. Clemens, the very decided differences at once satisfied me that the genera were not the same; and the species were accordingly described as belonging to the new genus *Hagno*. Subsequently, my attention was attracted to the close resemblance between the species, and a closer comparison has suggested the probability that Dr. Clemens has misdescribed the forewings of his genus, and that the two genera may be equivalent. The differences are confined entirely to the fore wings; but then they are decided, and are as follows:—

Dr. Clemens says that in *Psilocorsis* the hind margin is obliquely pointed. In *Hagno*, the costal and dorsal margins are nearly parallel. The wing is widest just before the apex, which is obliquely truncate with the angles rounded. In *Psilocorsis*, there is a secondary cell which I have not been able to detect in *Hagno*. In *Psilocorsis*, the subcostal gives off (besides the long branch from near the middle), *four* branches from *near the end of the cell*, and the *fourth* is furcate. In *Hagno*, only *three* are given off (besides the long one from the middle), from *near the end*, and the *third* of these is furcate. In *Psilocorsis*, the *median* vein gives off *four* branches from near the end of the cell. In *Hagno* only *three*. In *Hagno*, the discal vein gives off two branches, but Dr. Clemens does not mention any branches from it in *Psilocorsis*.

These differences are too great to occur in one genus; and as they first caught my attention, they satisfied me that the genera were very distinct. On closer examination, however, I cannot help suspecting that there is some mistake in Dr. Clemens' diagnosis, and that the genera will prove to be equivalent.

1. *H. cryptolechiella.*

   D. cryptolechiella. Ante p 91.

2. *H. faginella. N. sp.*

Ochreous yellow, with a silky lustre; anterior wings dusted with brown, and with confused indistinct dark brown blotches, and with a row of dark brown spots around the apex. The antennae are annulate with brown; the second joint of the labial palpi has a dark brown stripe along its under surface, which is continued along the under surface of the third joint to its apex, and the third joint likewise has a similar stripe along the outer, and one along its inner surface. Anterior surface of the two first pair of legs with dark brown patches, and their tarsi annulate with dark brown. *Alar ex.* ¾ inch. Kentucky.

The larva sews together the leaves of Beech Trees (*Fagus ferruginea*) feeding between them, and there passing the pupa state, the imago emerging in May. The larva is whitish, with the head ferruginous, the next segment faintly so, and there is a pinkish patch on each side of the anterior margin of the third segment.

H. cryptolechiella also pupates between the leaves of its food plant, and this habit, like the stripes on the palpi, which are common to both species, might almost be considered generic characters.

Depressaria cercerisella, ante p. 108, seems to connect this genus with that. It has the abdomen but little depressed, the palpi elongate, as in this genus, and the brush is scarcely deserving that name, being very small, and appearing to be divided only near the apex. It agrees also with this genus in carrying the wings rather more nearly horizontal than *Depressaria*, and while it has not the dark stripes on the terminal palpal joint, it has that entire joint black. But in *Hagno*, the anterior wings are not pointed, the apical margin being oblique, whilst in *D. cercerisella*, as in all my other species of that genus the anterior wings have the apex pointed or obtusely pointed. It also differs from *Hagno*, and agrees with *Depressaria*, in not pupating between the mined leaves.

TELPHUSA, *gen. nov.*

Nearly allied to *Depressaria*, from which it differs in having the abdomen not depressed, the antennae more setiform; the palpal brush very small, though there is a trace of a longitudinal division; and the terminal joint of the palpi longer than the second. The superior branch of the discal vein arises from a common stalk with the apical portion of the subcostal, so that the discal sends off but a single independent branch; but this is likewise the case in some species of *Depressaria*, as e. g. *D. pseudacaciella* and some others; and in all the species of *Depressaria*, when it is independent, it arises very close to the sub-costal, the difference in this respect being that the letter V, formed where they arise from a common stalk, is split at the apex, when they do not. *D. cercerisella* has the normal neuration of *Depressaria*, but has a very small scarcely divided brush. In *Hagno, mihi*, they are more distinctly separated than in any species of *Depressaria* that I have seen. With these explanations, the account which I have given of the neuration of *Hagno* will do for this genus and for *Depressaria* also. In *Hagno*, the palpi are as in *Depressaria*, except that there is no brush. *Enicostoma*, as defined by Clemens, has very nearly the same neuration with *Depressaria* also, but

has the third palpal joint short. In *Telphusa*, the costal margin of the hind wings is a little excised from about the middle to the tip, and the apical part of the subcostal vein is curved. In all these genera, as well as in *Callima* and *Tricotaphe*, the neuration of the fore wings is the same. The two latter genera differ somewhat from each other and from the preceding genera, in the neuration of the hind wings.

T. curvistrigella. N. sp.

Palpi dark purple, the tip of the second joint and an annulus near the tip of the third, white; head white; palpi white, annulate with dark purple above; thorax and anterior wings rich dark purple; at the base of the costa is a patch of whitish, mixed with purple, and just behind it is a rather wide white streak, which begins on the costa, crosses the wing obliquely to the dorsal margin, and extends along it and into the dorsal ciliae nearly to the apex; just behind the middle of the wing in the dark purple part of it, is a faint indication of a whitish fascia. *Alar ex.* 5/8 inch. Kentucky.

HINTS TO FRUIT GROWERS.

PAPER NO. 5.

BY W. SAUNDERS, LONDON, ONT.

THE PEACH BORER.

The wasp-like moth of the peach borer, *Egeria exitiosa*, will be busy during the present month, depositing her eggs on the bark of the trunks of the Peach trees; then as soon as the eggs hatch, the young grubs will begin to eat their way to the inner bark, where it is difficult to reach them. Much good may yet be done, either in preventing the moths from laying their eggs, or, if laid, in destroying the young larvæ, by brushing the trunks and main branches of the trees with soft soap, reduced with lye to about the consistence of paint. Fig. 8 respresents both sexes of the moth; 1 is the female, 2 the male. It will be observed that they are very unlike each other, so much so that they may readily be

Fig. 8.

mistaken for different species. Besides the disparity in size, the fore wings of the male are transparent, while those of the female are opaque, and blue; the female also has a broad orange colored belt encircling the abdomen, which is wanting in the male.

TENT CATERPILLARS.

It is gratifying to be able to note that the American Tent Caterpillar, *Clisiocampa Americana*, has been quite scarce during the present season, as compared with former years. In fig. 9 we give a side and back view *a* and *b*, of this well known pest; *c* represents one of the ring-like clusters of eggs, and *d*, the cocoon. During this month the eggs will be laid for the next year's crop of caterpillars; they are usually placed upon the smaller twigs of the trees, each ring or cluster containing about two hundred and fifty.

Fig. 9.

The Forest Tent caterpillar *Clisiocampa sylvatica*, fig. 10, has been equally scarce; indeed we have not met with a full-grown specimen of either variety this summer, although in past years they have swarmed on our trees and fences. Whether the severity of the weather last winter operated unfavorably upon them, or whether their decimation is due to the increase of their natural insect foes, we are unable to determine; the fact, however, is an interesting one.

Fig. 10.

THE GOOSEBERRY FRUIT WORM.

There is probably no insect more troublesome to the cultivator of the Gooseberry, or more difficult to contend with, than the worm which attacks the fruit, popularly known as the "goose-

berry fruit worm." It is a pale shining green or reddish-green caterpillar about three quarters of an inch long, with a pale brown horny-looking head, and with a patch of a similar colour on the second segment. It lives within the fruit, making its ingress and egress through a small hole, barely big enough to allow its body to pass through ; and as there is no room in the enclosure in which it lives for the larva to turn itself, when danger threatens it backs out very expeditiously, and by means of a silken thread, always ready, allows itself to drop gently to the ground; but when the disturber of its quiet has gone, it draws in the thread by which it had descended, and thus regains its former position. The first indication of its presence is in the premature colouring of the fruit it is operating on, and an unnatural grouping of the berries, which soon put on a withered look. On examination, it is found that the berries surrounding the one in which the insect lives have been drawn together, and bound with silken threads ; and to facilitate this binding process, such berries are usually detached from their natural position by biting through the stems, and are then held in place by the silken threads only. This insect does not confine itself to to the cultivated gooseberry ; we have found it on the wild ones as well, especially on the Prickly Gooseberry, *Ribes cynosbati*. It also freely attacks the Currant, both the white and red varieties, and occasionally though less often, it is found on the Black Currant likewise. In the case of these smaller fruits, a single berry is not large enough for the worm to shelter itself in ; so here it draws the clusters together and lives in their midst.

During the latter part of June, this worm, now full grown, lowers itself by the silken thread already referred to, to the ground, where it constructs a small silken cocoon amongst dry leaves or other rubbish, and within this changes to a dark brown chrysalis. It remains in this condition till the following spring, when it appears late in April as a small grey moth.

Fig. 11.

Fig. 11 represents the moth and chrysalis, natural size. The fore wings of the moth are pale grey, with many streaks and dots of a darker shade ; the hind wings paler and dusky. The moth deposits its eggs soon after the fruit has set, and when hatched, the young larva begins to burrow at once into the fruit. This insect has been very numerous during the present season. Where it once establishes itself it is very difficult to eradicate ; in proper time hand picking is the

surest remedy, but as the worms will, by this time, have gone into the pupa or inactive state, it is too late to apply this means now ; some good may, however, be done by raking up and burning all the dry leaves and rubbish under and about the bushes. It has also been recommended to give fowls the run of such places, when they are said to scratch up and devour many of the chrysalides. In the absence of such friendly help, a top-dressing of lime or ashes would probably prove beneficial. For fuller details in reference to this insect the reader is referred to the report of the Entomological Society of Ontario for 1871, p. 42 and 43.

DESCRIPTIONS OF

TWO SPECIES OF ANAPHORA.

BY AUG. R. GROTE, DEMOPOLIS.

In Dr. Clemens' Tineid genus *Anaphora*, the fore wings are 12-veined. The submedian fold, however, seems to me to become a true vein towards the margin, giving an additional vein (vein 1b). Internal nervure, vein 1a, shortly furcate at base. Median nervure sending out vein 2 near the extremity to internal angle ; and emitting 3 and 4, nearer together, on to the external margin. From the base of the wing at the middle of the discal cell, a "veinlet" is emitted which is furcate before the centre of the wing, sending one branch, the lower, out to extremity of the cell between the origin of 4 and 5, near 4, and angulatedly connected with it, while 5 seems independant. Its upper branch, apparently the "median fold," terminates between veins 5 and 6. An analogous "veinlet" is thrown off from the lower side of sub-costal nervure beyond the point of furcation of the median "veinlet," and terminates at the extremity of discal cell, and at the origin of vein 8. Veins 7, 8, 9, near together at base ; 8 to apex ; 9 to costa ; 10 a little removed at base ; 11 thrown off near base of the wing. Hind wings 8-veined ; veins 1a and 1b divaricating on to the margin. Discal cell closed by a "veinlet ;" vein 4 thrown off from a furcating median veinlet at the middle of the discal cell ; 5 thrown off from the "veinlet," closing the cell between 4 and 6, near to 6, which latter is sub-continuous with the upper fork of the median cellular "veinlet." The two internal veins are counted together. Vein 7 to apex ; 8 to costa shortly before the tip.

Anaphora mortipennella, Grote ♂.—Labial palpi reflexed, thrown back over and as long as the dorsum of thorax, but not closely applied, thickly scaled but less so than in allied species, fuscous outwardly along the sides, dead whitish on the inside. Head and thorax above dead or dirty whitish. Primaries pale, dirty whitish, with heavily sprinkled black scales on costal region at base, fading outwardly. A black scale patch at extremity of discal cell, and a larger one on submedian fold, below median vein, at about the middle of the wing; parallel with this at base, a few black scales. There is a faint sprinkling of black scales over the median nervules, and about internal angle are two or three better marked black points on the margin. Four costal black marks before the apex, the first of these above discal spot; other costal marks towards the base of the wing. Fringes fuscous, faintly lined. Secondaries fuscous, much darker than, and strangely contrasting with, the pallid primaries. Beneath both wings fuscous with ochrey stains. The basal joint of labial palpi is prominently dark fuscous or blackish outwardly. *Expanse 25 m. m.* Central Alabama. June.

Smaller than *A. plumifrontella*, and easily recognized by its pallid discolorous fore wings, which are also a little more determinate at apices and internal angle than usual.

Anaphora agrotipennella, Grote ♂.—Fuscous or blackish wood brown. Labial palpi reflexed, and as long as the dorsum of thorax, a little paler inwardly, blackish outwardly. Primaries above fuscous, blackish, with a light purplish reflection. From the base outwardly, below median vein, is a prominent pale streak fading externally, where it is diffuse and dark ochrey. It is bordered beneath at base by black scales like a dash, and surmounted and partly interrupted by a black scale patch below median nervure before vein 2. On the discal cell is an unprominent black scale patch towards the base, beyond which an obscure ochrey longitudinal median shade, sometimes lost, stretches over the nervules, and is interrupted at the extremity of the cell by a distinct black subquadrate scale patch. Faint blackish costal and terminal marks; fringes fuscous. Secondaries and their fringes fuscous. Beneath, both wings and body parts blackish-fuscous. *Expanse 27 m.m.* Central Alabama; June and July. Very common.

I have only seen males of this species, in which the ornamentation of the fore wings above recalls that of various species of *Agrotis*, such as *A. jaculifera*, etc. I have tried to recognize in this species *A. Popeanella*,

Clemens, from Texas, but I have failed to reconcile his description with my specimens, which are not "luteous or yellow along inner margin." In *A. agrotipennella*, at the extremity of the median ochrey shade subterminally, are a few black scale points. These can hardly be the same as the row "of dark brown spots" of *Popeanella*.

Neither can I, from the description, consider the differences of colour and ornamentation as produced by any defect in the condition of Dr. Clemens' specimens.

Recently, a specimen of *A. agrotipennella* came into my room to light, upon which, even before capture, I saw several large scarlet mites. Upon pinning the insect, I found them to be five in number, moving freely over the body. When the insect settled, they collected on the dorsum of the abdomen, and were hidden by the wings. The specimen did not seem to be suffering from the presence of these proportionately enormous external parasites. After the death of the moth, they left its body for the table, which they traversed in various directions with considerable celerity. I regret I did not observe them further.

The genus *Anaphora* is represented in Cuba by a species much exceeding in size our *A. plumifrontella*, which latter exceeds the two species described above in expanse. Specimens of the species above described are contained in Coll. American Ent. Society.

I am sure we are all grateful to Mr. Stainton for his collection, in book form, of the writings of the late Dr. Brackenridge Clemens, on North American *Tineina*. Within the limits of 282 beautifully printed pages, we have collected all of Dr. Clemens' writings on this group, with memoranda of his descriptions in other families of the moths, and copies of his correspondence. No student of North American Micro's can afford to be without this book, which is enriched with notes on our species by its talented editor. As a matter of international courtesy, this publication deserves meritorious remembrance.

From an original engraving of the head of *Anaphora Popeanella*, on page 60, fig. 4, we see that its palpal structure differs from that of *A. plumifrontella*, with which latter *A. mortipennella* and *A. agrotipennella* coincide.

MISCELLANEOUS NOTES.

Female Decoys.—Last summer an enthusiastic lepidopterist in Kingston put a young female *Cecropia* moth (*Platysamia Cecropia*) in a box, with wire gauze on one side, and placed it on his verandah—which,

by the way, is at a considerable distance from any trees. Although my friend did not watch very long, yet, the first night he caught five males, attracted thither in some unknown and mysterious way, by their fair relative; the second night, ten males were captured, and on the third, eight more were taken; while, in the morning, the scattered remains of five other amorous moths, (slain doubtless by the cats), were found lying near the cage. Several specimens of *Telea Polyphemus* were taken in the same manner. Is not this decidedly the easiest and most successful way of collecting a good harvest of these gorgeous creatures?—R. V. ROGERS, Kingston.

BLISTERING BEETLES.—During the past month complaints have reached us of the ravages of one of the Blistering Beetles, *Macrobasis fabricii*, Lec., (*Lytta cinerea*, Fab.,) on potato vines. They are said to have been very destructive in the township of Burford, destroying the tops in some localities, eating small holes all over the leaves.

Fig. 12.

Fig. 12*a* represents this species, the hair line at the sides showing its natural size. *b* is another variety of Blistering Beetle not yet found in Canada, but destructive to the potato in some parts of the United States.

Complaints reached us last year from a correspondent in the eastern part of Ontario, of the Striped Blistering Beetle, *Epicauta vittata*, fig. 13, damaging, in fact almost destroying a crop of Beets. In some of the southern parts of the Western States they are very abundant on the potato vines, sometimes injuring them considerably. Should any of our readers meet with either of these insects in any quantity, we should be greatly obliged if they would collect a few ounces of them and forward by mail, as we are anxious to have their medicinal value as blistering agents more thoroughly tested than they have heretofore been.—W. SAUNDERS, London, Ont.

Fig. 13.

STRIDULATION OF ORTHOSOMA CYLINDRICUM, *Fabr.*—The stridulating noises made by many Long-horned beetles (*Cerambycidæ*) are well known to be produced by rubbing the posterior margin of the prothorax against

certain horny processes between it and the mesothorax, or against the base of the elytra. It is not so generally known, however, that the above named insect forms a decided exception to the rule. This species is a true fiddler, stridulating like the Orthopterous *Locustidæ* by rubbing the hind femora against the elytra. If a specimen be carefully examined, the inside of these femora will be found rasped from the base to near the tip, by a number of short longitudinal ridges, which, when played against the thin and sharp emarginations of the elytra, produce the rather loud creaking so peculiar to this beetle.

I cannot recall any author who has published this fact, though as *Prionus coriarius* is called "the fiddler," in Germany, that species may stridulate in the same manner.—C. V. RILEY, St. Louis, July 9, 1872.

P. S. - *Prionus imbricornis* Linn. (i. e., the dark brown form which, I believe, is labeled *obliquicornis* in Le Conte's collection), likewise stridulates by rubbing the hind femora against the lateral edges of the elytra. But as the thigh in this species does not reach as far above the wing-cover as does that of *Orthosoma cylindricum*, we find no rasp on the inside, which is perfectly smooth; and the noise is produced by the friction of the inner lower margin, principally near the end of the thigh, where it is slightly dilated.--C.V.R.

INSECTS IN PENNSYLVANIA. -The Seventeen-year Locusts, as they are called, have made their appearance here and in the vicinity. Here, very abundantly, but diminish in numbers at Jersey Shore and Lock Haven. Further westward, I saw none. In the stage from the depot to Jersey Shore, I listened to an exposition by a physician! on the poisonous qualities of the insect in question, of the existence of which quality he was quite assured. The lady, however, who was his inquisitor, thought it strange if the "locusts" were really so poisonous, that the children, who handled them freely, were not more frequently poisoned. The doctor got over this by assuring the lady that they were not "aggressive."

Popular report gives the year 1865 as that of their last appearance, but this is not very reliable authority.

So far as intervals of business allow me to judge, I should say that insect life is not abundant in North-western Pennsylvania this year. An *Argynnis* observed at Ridgway, nearly at the summit of the Alleghanies, in considerable abundance. Have not yet determined the species. *Cicindelæ*, principally *repanda*, *12 guttata*, with a few *purpurea*, found on the banks of the Susquehanna from Schickshinny downwards. — W. V. ANDREWS, Williamsport, Pa., June. 1872.

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THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

Our readers will no doubt be pleased to learn that the condition and prospects of the Entomological Society are now eminently satisfactory. The roll of membership has been increased by upwards of forty names of new members during the current year. The Library, which now begins to form a very important feature in the attractions and usefulness of the Society, has been largely added to; among the rare and valuable books lately acquired, we may mention an excellent copy of Westwood's edition of Drury's Exotic Entomology, in three volumes, quarto, containing one hundred and fifty well executed coloured plates; Boisduval & LeConte's North American Lepidoptera, a scarce old book, containing 78 coloured plates; a complete edition of Kirby & Spence in four volumes, published in 1822; a good copy of Curtis' Farm Insects, containing 16 coloured plates, and a host of admirable wood-cuts; Boisduval & Guenee's Lepidoptera, in seven volumes, handsomely illustrated; Westwood's Classification of Insects; Agassiz's Lake Superior; besides many new works of value, and sets, more or less complete, of the publications of several leading scientific societies. We aim at the formation, in time, of a complete library of works upon American Entomology, supplemented by the leading publications of European countries. In this object it is in the power of many of our readers to afford us material assistance. Authors' own publications, the proceedings of Societies, gifts of books or donations in money to the Library fund, will always be most acceptable.

The Society has recently transferred its quarters from the City Hall, London, where it occupied a room kindly provided free of rent for some years by the City Corporation, to more accessible and convenient apartments on the corner of Dundas and Clarence Streets. Members and visitors will find in these rooms the cabinets and library of the Society, and every facility for the comparison and study of specimens.

The property of the Society has recently been enriched by the thoughtful bequest of its late lamented member and former Secretary-Treasurer, the Rev. James Hubbert, Professor at St. Francis College, Richmond, P.Q. Shortly before his death, which occurred in Florida, whither he had

gone for his health, he bequeathed to the Society his large cabinet of fifteen drawers, and a good useful microscope. The former will be devoted to the reception of a collection of local insects, while the latter will at all times be at the service of members for the purposes of study and investigation.

It has been a source of no small gratification to the editor and his coadjutors to receive so many kind expressions of appreciation of their "Annual Report to the Legislature of Ontario," which has been recently distributed among all the members of the Society. The favorable notices, too, that have appeared in many English and American publications, afford them much encouragement in the prosecution of their entomological labours, to which they regret they are unable to devote more than a small proportion of their time, each of them being necessarily engaged in other deeply engrossing pursuits, and having but little leisure at his command. They are happy to be able to record that the issue of the CANADIAN ENTOMOLOGIST during the current year has so far been regular and punctual, and they trust that it will continue to be so in future. They very gratefully acknowledge the valuable assistance they have received from many friends in various parts of the United States and elsewhere, whose contributions have given their publication a scientific status that it would not otherwise have attained. They earnestly trust that these favours will be continued to them, and that many others also will be led to join their corps of correspondents, and afford tidings of the insect world from all parts of the continent of America.

ONE WORD MORE.—The Secretary-Treasurer desires the attention of members in arrears to the fact that the financial year of the Society closes in September, when a report of receipts and expenditures has, by law, to be presented to the Legislature. As there are still nearly fifty who have not yet paid their subscriptions, he trusts that this intimation will suffice, and that they will kindly send him the amounts respectively due by them at their earliest possible convenience.

DESCRIPTION OF THE FEMALE OF

ANAPHORA AGROTIPENNELLA.

BY AUG. R. GROTE, DEMOPOLIS.

In this sex, the labial palpi are short, not exceeding the front to which they are closely applied, porrect. In the male they are reflexed

and thrown back over the dorsum of the thorax, which they equal in length. In colour and appearance the sexes do not differ. In repose, the ♂ labial palpi are closely applied to the thorax in the living specimen, and from their pale ochrey outer colour have the effect of thoracic vittæ. In my original description I call them blackish "outwardly;" the exposed upper portion is pale or ochrey, else they are blackish. In the dried specimen they are apt to become a little elevated. *A. agrotipennella* varies in the obsolescence of the discal ochrey shades, while the pale submedian dash itself is sometimes a little indistinct. I have already noted that Dr. Clemens' *A. Popeanella* disagrees with *A. agrotipennella* by, among other characters, its being described as luteous along the inner margin; that author's description of *A. arcanella* better agrees, but this must be decidedly distinct also, since Dr. Clemens places *A. arcanella* in a distinct section; labial palpi shorter in the ♂ than in the other species; ascending but not recurved. This character is totally opposed to our species, in which the ♂ labial palpi are as long as in *A. plumifrontella*, which latter species I have taken at night at Hastings, on the Hudson, N.Y., in July. There is a certain correspondence in the position of the dark spots on the fore wings in this genus, which gives a similarity to the specific diagnoses.

NOTES ON ATTELABUS BIPUSTULATUS, *Fabr.*

BY MARY E. MURTFELDT, KIRKWOOD, ST. LOUIS, MO.

In the spring of 1871, my attention was attracted by the peculiar manner in which many of the leaves of the Laurel Oak (*Q. imbricaria*) were rolled up. The cases thus formed were compact and cylindrical, varying in length from one third to one half an inch, by an average diameter of one-fifth of an inch, and very neatly finished up. Several of them were opened, and each found to contain a single, smooth, spherical, translucent-yellow egg, about 0.04 inch in diameter. Desirous of rearing the insects, I collected quite a number of the interesting little nests, and watched, with much curiosity, for the larvæ to appear—not knowing, at that time, what to expect. But my observations were not rewarded; and, after several weeks of impatient waiting, I made another examination into the contents of the now blackened and shriveled up cases, and found two or three very small larvæ, dead and shrunken, but evidently of some curculio.

During the latter part of April of the present year, I again found the cases in considerable number on the same species of Oak; and one evening, about the 1st of May, after sunset, I was so fortunate as to discover the parent beetle in the act of finishing up one of her nests, trimming up and tucking in the ends with her beak. After watching her movements for a short time, I secured both beetle and case. The former was at once submitted to Mr. Riley for determination, and pronounced to be *Attelabus bipustulatus*, of Fabricius.

If one of these nests be very carefully unrolled, the *modus operandi* of its construction can readily be seen. The egg is first deposited near the tip of the leaf, and a little to one side; the blade of the leaf is then cut through on both sides of the mid-rib, about an inch and a half below; a row of punctures is made on each side of the mid-rib of the severed portion, which facilitates folding the leaf together, upper surface inside, after which the folded leaf is tightly rolled up from the apex to the transverse cut, bringing the egg in the centre; the concluding operation is the tucking in and trimming off the irregularities of the ends. No trace of any gummy substance to assist in keeping the case in shape can be perceived, except the slight extravasation of sap caused by the punctures and pressure of the beak of the little artisan.

As I have never been able to observe these beetles working on their cases in the day-time, except on the occasion referred to, when it was already growing somewhat dark, I conclude that their period of greatest activity is during the night.

Observing that the cases invariably dropped to the ground a few days after completion, I collected a number, and placed them upon moistened sand in a breeding jar. By May 15th, several of the eggs had hatched, the tiny larvæ produced from them being oval, translucent-white, with strong brown jaws; they seemed to be feeding upon the dry substance of their nest. An examination a few days later showed this to be the case, as the larvæ had grown considerably, and had excavated quite a cavity in their dwelling. On opening one of the nests about the last of May, I was much surprised to find the inhabitant already in the pupa state. Several of the remaining cases—which were by this time reduced to mere shells—contained full-grown larvæ, of which the following are the general characteristics:—

Average dorsal length 0.22 inch, diameter on abdominal segments 0.06 in., tapering anteriorly from fourth segment. Color shining yellowish-white; thoracic segments slightly depressed on dorsum and swollen on

venter; abdominal segments convex above and flat beneath, each one divided into three irregular shallow transverse folds, lateral surfaces with a double row of smooth polished oval tubercles, most symetrical in form and position from segments 4 to 11 inclusive; above the tubercles on each segment is a deep depression; a few fine light hairs are scattered over the general surface. Head horizontal, rounded, small—about half the diameter of first segment, into which it is somewhat retractile—shining, translucent white; mandibles and other mouth parts reddish-brown, surrounded by longish hairs. Some of the larvæ have from three to five fine purplish longitudinal lines on dorsum, the medio-dorsal one being most distinct; in others these lines are wanting. They always remain curled up, and move sluggishly on one side if placed upon a flat surface.

The pupa is cream-white in color, 0.12 inch in length, broadly shouldered with an almost triangular outline; thorax bent forward, beak pressed down and extending below wing cases; on top of thorax is a shallow depression surrounded with short brown hairs; abdominal segments sharply ridged and roughened with minute hairs, posterior extremity terminates in a pair of bristly points, white, tipped with brown. The change to pupa takes place inside the larval nest, and the insects remain in this state only from five to seven days, the first beetles issuing on the 2nd of June.

The perfect insect is well known: a small, highly polished, black curculio with two large orange-red spots at bases of elytra. It has been figured by Harris in his "Injurious Insects," but his description of the cases of *Attalabus* as "of the size and shape of thimbles," does not apply to this species, nor does he record any observations upon the habits of the larvae.

I have also found the cases of this curculio on the leaves of Red and Post Oak, and recently took a single one, some larger than the others, on Hazel. The Laurel Oak, however, seems to have the preference, and the cases formed from its leaves are much neater and more symetrical than those found on other trees.

The second brood of larvae may be found early in July.

American Association for the Advancement of Science.—The Rev. C. J. S. Bethune and Mr. W. Saunders, the President and Vice-President of the Entomological Society of Ontario, have left for Dubuque to attend the meeting of the Association as representatives of Canadian science.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 133.

CIRRHA, *gen. nov.*

At page 92, ante, I have described as *Depressaria albisparsella*, a species which, on examination of other specimens, I have concluded to make the type of a new genus. As stated on a preceding page, the species was described from a single captured specimen, the wings of which were not spread. The specimen was also slightly injured, so as to cause the brush on the palpi to appear to be divided, and to obscure some of the markings of the wings, which are faint even in perfectly fresh specimens. Since then I have bred and captured other specimens, and find that it differs from *Depressaria* in the following particulars :—

The antennæ are more distinctly pectinated, the brush on the palpi is long, ragged, *and not divided*, and the abdomen, though depressed, is not flat enough for *Depressaria*.

Having ascertained its food plant, I have given it a more appropriate specific name, and annex the following more correct description :—

C. platanella.

(Depressaria albisparsella, ante, p. 92.)

Dark gray-brown, the head a little paler and somewhat iridescent; palpi and antennæ dark brown; anterior wings dark gray-brown; about the middle is a small pale or whitish spot, and there is another of the same hue and equally indistinct about the end of the disc, behind which is an indistinct whitish narrow fascia sometimes obsolete in the middle. *Alar ex.* 5/8 in; Kentucky.

The larva feeds on the underside of leaves of Sycamore trees *(Platanus occidentalis.)* It is yellowish-white, with contents green, and it lives in a roll or short tube formed of the down of the underside of the leaves. Imago in the latter part of June.

DEPRESSARIA.

Further study induces me to make the following additional remarks and changes of the species which I have placed in this genus. Dr. Clemens, in his account of his *Depressaria Lecontella*, states that it is the only true *Depressaria* "he has thus far met with," adding that "we possess numerous nearly allied species." Mr. Stainton, in his edition of

Dr. Clemens' papers (a copy of which he has kindly sent to me), suggests that these species probably belong to *Cryptolechia* (Dr. Clemens having also suggested that they were intermediate between *Gelechia* and *Depressaria*). I have little doubt that the majority of the species which I have placed in *Depressaria* belong to this intermediate group. But from an unwillingness to multiply genera, I have placed them in *Depressaria*, indicating the points in which they structurally differ from that genus, and giving, when known, the food plant of the larvæ, so that the insects may be identified and disposed of in other genera by future students having easier access to European specimens, and to the works of European authors. I will, however, indicate my views as to their generic affinities a little more fully. *D. cryptolechiella* I have already removed to *Hagno*, and *D. albisparsella to Cirrha*.

D. dubitella, I am satisfied, should be removed, at least provisionally, to *Gelechia;* though even the elastic limits of that accommodating genus (the Micro-Lepidopterist's "waste-paper box") will hardly stretch to receive it. Still it is nearer to that genus than to *Depressaria*.

D. cercerisella, I think, will hereafter be placed in *Cryptolechia*, but I have not sufficient knowledge of that genus to be certain. Mr. Riley informs me that he has known the species long, and has referred it doubtfully to *Gelechia*. I think, however, that it is nearer to *Depressaria*.

D. bimaculella must accompany *D. cercerisella*.

R. Rileyella I consider a true *Depressaria*.

D. bistrigella, D. fusco-ochrella, D. fuscolutella, D. obscurusella, D. pseudacaciella, D. bicostomaculella.

In these six species the palpal brush is longitudinally divided, but the brush is *rather* too small, the anterior wings are too narrow, and the colours are too dark brown for *Depressaria*, and the abdomen, though depressed and tufted at the sides, is hardly *flat* enough for *Depressaria* proper. Yet as I cannot place them in *Gelechia*, and from the divided brush they cannot belong to *Cryptolechia*, I leave them for the present in *Depressaria*. The division of the brush is much more distinct in the living insect than in the mounted specimen.

D. querciella has the same structure as the six preceding species, except that it possesses a small double tuft at the apex of the thorax. It is not a true *Depressaria*, and is probably the type of a new genus.

D. pallidochrella and *D. versicolorella*.

These species have the abdomen as distinctly flattened and tufted at

the sides as the true *Depressariæ*, and the brush is as distinctly divided. Their small size, narrow fore wings, and deep emargination of the hind wings beneath the apex, suggest doubts as to the propriety of their location in *Depressaria*.

I have described the neuration of these species as compared with *Depressaria* in a previous paper.

In all of these species (except *dubitella ?*) the wings in the living insect are carried almost horizontally, or but little deflexed, in repose.

One colourational peculiarity is common to many of the species which I have placed in *Depressaria* and to many species of *Gelechia;* that is, the costal pale streak at the beginning of the ciliæ, and the opposite dorsal one. Another peculiarity, though possessed by some *Gelechiæ*, is more characteristic of *Depressaria:* that is, the small ochreous or brown spot or spots on the disc. *Gelechia dubitella (Depressaria dubitella, ante)*, has the discal ochreous spot, but not the costal or dorsal streaks. *D. ? cercerisella* has the costal and dorsal streaks and about four small ochreous spots on the disc. (By an oversight, I omitted to mention these in the description). In *D.? bimaculella*, the costal and dorsal streaks are white, and there is a rather large white spot on the disc. In *D. Rileyella* and *D. fuscoluteella*, the costal and dorsal streaks are absent, and the discal spots are minute, indistinct, and dark brown. *D.? pseudacaciella* has the costal and dorsal streaks, but not the dots on the disc. So have *D. bistrigella* and *D. bicostomaculella*. In *D. querciella*, *D. pallidochrella*, *D. versicolorella*, *D. fusco-ochrella*, and *D. obscurusella*, neither the marginal streaks nor discal spots are perceptible.

Though I think that hardly enough weight is given to the "pattern of colouration," as characteristic of genera, and even perhaps of higher groups, neverthless its value is subordinate to that of structure, and in the genus allied to *Gelechia*, one is soon at a loss as to what value really should be attached to it. As the genus *Gelechia* is at present constituted, I do not doubt that many, perhaps most entomologists, would place the majority of the above described species in that genus. But a genus which contains them, and such species as *G. roscosuffusella* (which Mr. Stainton says is a true *Gelechia*), to say nothing of such species as *G. Hermonella*, is certainly a hetorogeneous assemblage. Perhaps, however, that is not a very serious objection, for in my humble judgement no well defined and constant line exists between *Depressaria* (including in it *Exaeretia* and *Orthotelia*) *Cryptolechia*, *Gelechia* and other allied genera, and the more

thoroughly the allied species are made known, the more completely will the supposed distinction vanish.

ADRASTEIA, *gen. nov.*

The two following species resemble each other very closely, not only structurally, but in ornamentation. They are closely allied to *Gelechia*, or rather to some species of that genus. The second joint of the palpi is clothed beneath with a dense *spreading*, but scarcely divided, brush; the basal joint of the palpi is distinctly clavate, and the wings have distinct though small tufts of raised scales, and rows of separate raised scales not in tufts. Having but a single specimen of each species, I have not denuded the wings to examine the neuration. It, however, can be seen to approach closely that of *Gelechia*, if it is not identical with it. In all other respects the genus agrees with *Gelechia*.

A. Alexandriacella. N. sp.

Head and second joint of the palpi grayish-white flecked with dark brown; third joint dark brown, with the tip and an annulus about the middle, white. Antennæ dark brown, faintly annulate with white; thorax, to the naked eye, gray; under the lens, white, flecked densely with dark brown, and with a minute ochreous or yellowish-white tuft on each side at the tip; anterior wings to the naked eye gray, mottled with dark brown spots and with a few small white spots; under the lens they appear dark brown, largely intermingled with grayish-white, and the white spots are seen to be four minute tufts of raised scales placed · ⁚ · An irregular white fascia, angulated in the middle towards the apex, crosses the wing at the beginning of the ciliæ. To the naked eye, this fascia appears as two small white streaks, one at the beginning of the costal, and the other of the dorsal ciliæ. Apex dark brown, with a row of small white spots around the base of the ciliae; ciliae pale luteous, dusted with dark brown. Posterior wings pale fuscous; abdomen pale fuscous, somewhat iridescent. *Alar ex.* 5/8 inch. Captured at Alexandria, Kentucky, in June.

A. fasciella. N. sp.

Head yellowish-white, dusted with dark brown; antennæ dark brown; first and second joints of the palpi dusted with dark brown, third joint dark brown, scarcely flecked with white, and white at the tip; thorax and anterior wings, pale gray mottled with small dark brown spots, one of which is just within the dorsal margin near the base, another behind the

first and on the costal margin, another just within the dorsal margin, about the middle, with a small one near it on the disc, a larger one about the end of the disc, with a small one near it on the costal margin, just behind which is a narrow angulated white fascia indistinct in the middle. There is a small tuft of ochreous scales on each side of the apex of the thorax, a scattered patch of raised scales about the basal fourth of the wing just within the costal margin, another behind it near the dorsal margin, another further back near the costal margin, and a row of scattered raised scales within the dorsal margin. Viewed along the surface from the direction of the base of the wings, these raised tufts and scales exhibit prismatic colors. *Alar ex.* 5/8 inch. Kentucky, in June.

ERRATA.—Ante p. 127, for "costalous" read "costal pale ochreous." In the description of *D. pseudacaciella*, line 4, place the ; before "especially" instead of after it.

NOTES ON LIMOCHORES BIMACULA, *Scudd.*

BY C. S. MINOT, BOSTON.

The following is a description of *Limochores bimacula*, Scudd ♂, *Hesperia acanootus*, Scudd., which I drew up some time ago :—

Dark brown marked with chrome yellow.

Above: head, thorax, abdomen and antennæ black, the head and abdomen having a few yellow hairs. Both wings dark olive brown; primaries with an indistinct spot a little above and beyond the outer termination of the disk; a large patch extends over the middle third from the outer margin to the disc, and is crossed by a black velvety dash, which if continued would bisect the apical angle. *Secondaries* with chromaceous hairs over the central and basal portions.

Beneath: palpi, femurs, thorax, abdomen, and the fringes of the wings whitish, both wings chromaceous. *Primaries* with three bright spots, and black at the basal, grey along the interior part of the wing. *Secondaries* with the costa slightly and the abdominal fold more or less covered with black scales and hairs.

♂ ♂ ♀ ♀ taken in the last of July and first of August in company with *Euphyes metacomet*, Harr., to which it is closely allied.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 118.)

FAMILY ANOBIDÆ.

[190.] 253. ANOBIUM FOVEATUM *Kirby*.—Length of body 2 lines. A pair taken in Lat. 65°.

This species very closely resembles *A. striatum*, of which it may be regarded as the American representative. It differs principally in having a rather large excavation in the middle of the elevated back of the prothorax, the sides of which are armed with a triangular tooth or prominence.

The male is obscurely rufous, both above and below, the female is browner above. [Taken in Canada by Mr. Billings. Belongs to the genus *Hadrobregmus*.]

254. CIS MICANS *Fabr.*—Length of body 1 line. Two specimens taken in the Expedition.

Body subcylindrical, black-brown, glossy, with numerous short upright pale rather glittering hairs; minutely but not very visibly punctured. Head rather flat and lacunose; antennæ and legs testaceous. Prothorax anteriorly sinuated on each side with the middle lobe rounded and projecting a little over the head; sides slenderly margined; posterior angles rounded. Punctures of the elytra seem almost, but very indistinctly, arranged in rows.

[191.] FAMILY SCOLYTIDÆ.

255. TOMICUS PINI *Say*.—Length of body 1¾—2 lines. Frequently taken in the journey from New York to Cumberland-house, and also in Lat. 65°.

Body cylindrical, deep chestnut, glossy, hairy underneath. Head above with scattered granules; nose fringed with yellowish hairs; antennæ testaceous: prothorax rather oblong, angles rounded, anteriorly granulated with minute elevations, posteriorly punctured with scattered punctures, hairy next the head and on the sides: elytra hairy on the side, with five rows of transverse punctures next the suture, which reach only to the truncated part: punctures of the side and apex scattered; apex truncated

obliquely and excavated, with the external edge of the excavation armed with four denticles, of which the second and third are the largest: legs pale chestnut; tarsi testaceous.

In the other sex? the elytra are entire and unarmed, and the dorsal rows of punctures on the disk of the elytra are more numerous.

VARIETY B. Entirely rufous, or pale-chestnut. [Quite common in Canada under bark of Pine trees.]

[192.] 256. APATE BIVITTATA *Kirby*.—Plate viii., fig. 5.—Length of body 1¾ lines. A pair taken in the Expedition.

Very near *A. domestica* (*A. limbata* F.) but distinct. Body piceous or nigro-piceous, cylindrical; underneath with some scattered pale hairs. Head rough with minute elevations or granules; nose terminating in a transverse ridge; antennae testaceous with a very large knob: prothorax subglobose, reddish, rough behind with numerous transverse rugosities; before with sharp points or denticles; elytra with several rows of punctures, and two luteous stripes which unite at the apex of the elytrum; or perhaps it might be better to say, luteous, with two piceous stripes, one of the disk and the other of the side, but not reaching the apex: anus and legs testaceous.

In the other sex the front, or rather face, is hollowed out into a concavity; the prothorax is black anteriorly, and less rough from rugosities and points. [Belongs to the genus *Xyloterus*, Er. LeConte (Trans. Am. Ent. Soc., 1868) states that this species is taken from "Maine to Alaska. In the ♂ the head is concave, and the thorax finely transversely asperate before the middle; in the ♀ the head is convex, and the thorax much more roughly asperate. This species varies greatly in colour, the black elytral vittæ sometimes occupy nearly the whole surface, and sometimes are almost wanting."]

[193.] 257. APATE RUFITARSIS *Kirby*.—Length of body 1¾ lines. Two specimens taken in the Expedition.

Body cylindrical, black, hairy underneath. Head hairy; face concave; antennae pale testaceous: prothorax rufous posteriorly, granulated especially anteriorly; elytra punctured in rows, rufous, with a black humeral blotch: tarsi rufous.

The face of the other sex is probably plane; and the prothorax with more prominent points and asperities. [Unknown to LeConte.]

258. APATE (LEPISOMUS) RUFIPENNIS *Kirby*.—Plate viii., fig. 2, Length of body 1¼ line. Two specimens taken in Lat. 65°.

[194.] Body black, minutely punctured, hairs white, decumbent; those of the prothorax and elytra looking like minute scales. Head with a pair of minute tubercles, not easily discovered, in the space between the eyes, anteriorly transversely impressed; mouth and antennae pale rufous: prothorax very thickly and minutely punctured, with a rather obsolete longitudinal dorsal ridge: elytra dull-red, with several rows of larger punctures, the interstices of which are very minutely and thickly punctured, at the base rough with minute elevations: legs rufous. [Belongs to *Polygraphus* Er. Taken according to LeConte in "Alaska, Canada, Maine, Louisana." (*Vide* Trans. A. E. Soc., Sept. 1868, p. 169).]

259. APATE (LEPISOMUS) NIGRICEPS *Kirby*.—Length of body 1 line. A single specimen taken in Lat. 65°.

Smaller than the preceding. Body rufous, minutely and thickly punctured. Head black, with a very minute tubercle between the eyes; nose impressed; antennae and underside of the head pale rufous: elytra sculptured as in the preceding species, but the rows of punctures are less conspicuous. [Synonymous with the preceding, according to LeConte.]

260. APATE (LEPISOMUS) BREVICORNIS *Kirby*.—Length of body 1 line. A single specimen taken in Lat. 65°.

Body black, covered with hoary hairs, above resembling scales. Antennae very short with a small knob, rufous: front without a tubercle, nose not impressed; elytra not striated. This species seems to indicate another section of the genus. [Unknown to LeConte.]

[195.] 261. HYLURGUS RUPIPENNIS *Kirby*.—Length of body 3 lines. Many specimens taken in the journey from New York to Cumberland-house, and in Lat. 65°.

Body dusky, hairy, rather glossy, punctured. Head black, confluently punctured; vertex obsoletely channelled; antennae rufous: prothorax constricted anteriorly, and dusky-rufous; base with a double slight sinus, and dorsal ridge terminating in an impression at the angle between the sinuses: elytra rufous, furrowed; furrows punctured; interstices of the furrows rough with minute elevations, especially at the base, which is inflexed: tibiae and tarsi dull-rufous; the former denticulated on one side.

N. B. In some specimens the elytra and anterior part of the prothorax are piceous or nearly black; in others the elytra are testaceous, and the prothorax piceous and paler anteriorly. [Belongs to *Dendroctonus* Er. Taken in Alaska. "The punctures of the thorax are not very dense, and of two sizes intermixed."—Le Conte.]

FAMILY CURCULIONIDÆ.

[196.] 262. CALANDRA PERTINAX *Olivier*.—Length of body 7 lines. Taken in Canada by Dr. Bigsby.

Body obversely pear-shaped, black, naked. Head immersed in the prothorax, smooth; rostrum rather shorter than the prothorax, compressed, impunctured, channelled above at the base and tumid; antennae a little longer than the rostrum, scape as long as the rest of the antennae, knob pear-shaped: eyes immersed, lateral, subovate, not meeting below: prothorax oblong, rather narrowest anteriorly, tricostate, the two lateral costae sending a branch towards the base; four depressed broad punctured dull-red stripes occupy the intervals between the elevated parts; sides a little elevated and punctured; the punctures of the stripes and sides are whitish; scutellum an isosceles triangle, excavated at the base: elytra oblong, very slightly furrowed with whitish punctures in the furrows; suture, and alternate interstices, elevated; the others or depressed ones dull-red: body underneath with scattered whitish punctures varying in size; postpectus and tarsi chestnut. [Belongs to the genus *Sphenophorus* Schonh., of the family *Curculionidæ*. Not uncommon in Canada.]

263. HYLOBIUS CONFUSUS *Kirby*.—Length of body 4¼ lines. Taken in Canada by Dr. Bigsby, also in Massachusetts by Mr. Drake.

[197.] Body oblong, of a dark pitch-colour, hoary from decumbent hairs, confluently more or less punctured. Rostrum thickish and rather shorter than the prothorax; thickly and confluently punctured: prothorax with a dorsal levigated line not reaching the base; disk with numerous confluent irregular excavations or wrinkles; sides confluently punctured: elytra with ten rows of oblong deep punctures, the interstices of which are confluently punctured, mottled confusedly, except at the base, with whitish hairs: thighs armed with a short tooth; tibiae, as in the other species of the genus, armed at the apex with an inflexed stout spine or claw; tarsal claws reddish.

264. LEPYRUS COLON *Linn.*—Length of body 6 lines. Several specimens taken in Lat. 65°. Also taken by Dr. Bigsby in Canada.

Body black covered with decumbent gray hairs. Rostrum arched, thickish, a little longer than the prothorax, confluently punctured, having also a dorsal longitudinal ridge, terminating between the eyes in a little narrow excavation: prothorax narrowest anteriorly, covered with minute elevations producing wrinkles, and having also a dorsal longitudinal ridge

and two oblique, rather curved stripes formed of dense white hairs: the elytra have several rows of punctures, with the interstices minutely granulated; each elytrum has a discoidal white dot a little below the middle, and, in several specimens, there is also an indistinct one between it and the apex: on each side of the abdomen underneath, as in *L. arcticus*, are four yellowish round spots formed of hairs. In some specimens the pubescence has a tawny hue, in others the indistinct spot is obliterated. [Taken in Canada.]

[198.] 265. LEPYRUS GEMELLUS *Kirby*.—Plate v., fig. 7.—Length of body 7¼ lines. A single specimen taken in Lat. 65°.

Body very black, covered more or less with decumbent white hairs, and also with minute tubercles. Rostrum as in *L. Colon:* prothorax ridged, confluently tuberculated, minutely punctured between the tubercles, marked on each side with an oblique stripe composed of white hairs: elytra confluently tuberculated, with five pairs of longitudinal streaks, converging towards the apex: the first and fifth including the rest.

[199.] 266. CLEONIS VITTATUS *Kirby*.—Length of body 3½—5 lines. Several specimens taken in the Expedition.

Body narrow, black, covered with decumbent hoary pile. Head thickly covered with hairs, but on each side from the eye to the insertion of the antennae, the hairs are less dense, which gives the appearance of a blackish stripe; rostrum thick, shorter than the prothorax, obsoletely ridged, punctured: prothorax obsoletely ridged, punctured with rather large scattered punctures, often concealed by the hairs, with three blackish stripes, produced as in the head by the hairs being thinner: the elytra also have three similar stripes, and are punctured in rows: the abdomen underneath appears as if dotted with black from the same cause.

ZOOLOGICAL PARALLELISM.

BY PROF. JAMES T. BELL, BELLEVILLE.

In making a general survey of the Animal Kingdom, it is impossible to avoid being struck by the remarkable parallelism which exists between the several orders and families, and even genera and species, that compose the respective classes into which it is divided, and which reveals itself in the representative types that abound throughout its whole extent.

Thus if we take the mammalia as our starting point, we shall find that the carnivora are represented among the birds by the raptores, among the reptiles by the crocodiles and serpents, among the insects by the predaceous beetles, ichneumons, and dragon-flies, among the annulosa by the spiders, crabs, lobsters, &c., among the mollusks by the cuttle-fish and by some of the gastropods and a few brachiopods, and among the radiates by the sea-urchins, star-fish, sea-anemones, and many of the animalculæ.

Confining our observation to the parallelism between the mammalia and the birds on the one hand, and the insects on the other, we find that the carnivorous mammals are well represented among the Coleoptera as follows:—The felidæ, the typical carnivora, by the Cicindelidæ, whose resemblance is acknowledged in their vernacular name of "tiger-beetles." The canidæ, dogs, wolves, foxes, are fitly represented by the Carabidæ, the weasel tribe by the Staphylinidæ, and the hyænas and vultures by the Silphidæ; while the marine carnivora, the seals and whales, find their representatives in the Dytiscidæ and Hydroidæ; and the various species of raptorial birds are no less fittingly typified by the Libellulidæ, ichneumon-flies, sphexes, and the predaceous wasps and hornets; not forgetting the ants, which have a highly developed carnivorous organization.

I shall not follow out in detail the obvious resemblances that may be observed between the pachydermatous animals and the Lucanidæ and other dendrophagous insects, as well as between the bovine, equine, and ovine tribes, and the gallinaceous and cursorial birds on the one hand, and part of the Scarabeidæ and Chrysomelidæ, and most of the Orthoptera on the other; or those not less remarkable that exist between the goat, deer, and antelope families, and the Cerambyx, Clytus, and Leptura genera.

If the hints I have thrown out should induce some of my younger entomological brethren to study more closely the relation of the Insects to the other members of the Animal Kingdom, my intention will be amply fulfilled.

PERSONAL.

Baron Osten Sacken.—We regret to announce that this eminent Dipterist has returned to Europe "for an indefinite period, several years, or perhaps for ever." His last contribution to American Entomology will,

he informs us, be the Third Volume of the Monographs of N. A. Diptera, written by Mr. H. Loew, of Meseritz, Prussia, and translated by the Baron. It will shortly be published by the Smithsonian Institution, uniform with the preceding volumes. Baron Osten Sacken, as our readers are no doubt well aware, is the great, if not the only, authority of American Diptera, and was always, during his long residence in the United States, most ready and willing to afford any information or assistance that was sought from him. We deeply deplore his removal from us, and trust that it will only be temporary after all. He bears with him our best thanks for his many kindnesses, and our hearty wishes for his continued welfare and prosperity, wherever he may be.

MR. C. V. RILEY.—We are desired to announce to our readers that Mr. Riley is making a special study of Galls, with the intention, before long, of publishing a full and illustrated paper upon the subject. He will be glad to receive the co-operation and assistance of all who can aid him in his investigations. It is in the power of every collector to do something in this way, for no one can be much afield in quest of insects without observing many specimens of these wonderful structures. Samples can be easily transmitted by mail to Mr. Riley at a very trifling expense. He expresses himself willing to assist others, as much as he is able, by exchanges, etc. He purposes henceforth making the *habits* of insects of all orders, and the study of Galls more particularly, his specialty. His address is C. V. RILEY, office of the State Entmologist, cor. 5th & Olive streets, St. Louis, Mo.

CRAMBIDÆ.—Mr. W. Saunders (London, Ont.) is engaged in working up the history of the various species of *Crambidæ* inhabiting Canada and the adjoining States. He will be thankful for any assistance that may be afforded him by loan of specimens, and information as to locality, time of appearance, etc.

HEMIPTERA.—Mr. E. Baynes Reed (London, Ont.) is preparing a list of Canadian Hemiptera. As nothing has hitherto been done in this order in Canada, the co-operation of all members of the Society is much required in order that the catalogue may be rendered as complete as possible. Specimens will be gratefully received by Mr. Reed, and returned when desired.

PROF. MACOUN.—This gentleman started about the middle of last month upon a five weeks' collecting tour along the North Shore of Lake

Superior. He devotes his attention chiefly to Botany, but intends collecting Coleoptera at a few special localities. We look for some good results.

NEW ILLUSTRATED WORKS ON AMERICAN LEPIDOPTERA.

The Lepidopterist of the present day—be he merely a collector of these beautiful "winged flowers," or a student of the order—possesses vastly improved advantages over his predecessor of even ten years ago in the accurate and artistic drawings that are being so copiously issued from the press. There are now no less than three serial works in the course of publication, whose chief object is to afford faithful coloured illustrations of Butterflies and Moths. Foremost amongst these is a work that bears off the palm beyond all competitors in this or any other land—one that we have often before noticed in these pages, but which we cannot too often or too highly commend—*Edwards' Butterflies of North America.* This magnificent publication has now reached its Ninth Part, and will with the next issue complete its First Volume. We earnestly trust that its talented author will not rest content with this splendid monument of his industry and ability, but will go on with the work till the beauties of all our Butterflies have been faithfully portrayed. Since our last notice, two new numbers have appeared: Part viii., containing illustrations of *Nephasia menapia, Pieris Beckerii (N. sp.), P. vernalis, P. virginiensis, Argynnis Nevadensis, Grapta comma,* and *G. dryas;* Part ix., containing *Papilio Ajax,* varieties *Walshii, Telamonides* and *Marcellus, Grapta interrogationis,* varieties *umbrosa* and *Fabricii.*

Next to Mr. Edwards' work comes a new serial by Mr. R. H. Stretch, of San Francisco, Cal., entitled *Illustrations of the Lygænidæ and Bombycidæ of North America,* whose object is "to furnish, in a compact form, good coloured illustrations of all the species of these two families of Moths found north of the Mexican boundary, with accompanying letterpress, embodying everything of interest in relation to each species which may have appeared in print, together with additional information from original sources." Two parts out of the proposed thirty have thus far appeared; the remainder are to be issued at intervals of about six weeks. Part i. contains good coloured drawings—not equal indeed to those in the above-mentioned work, but still very good and reliable—of eight species of *Alypia, Scepsis fulvicollis* Walker, six species of *Ctenucha,* and

Psychomorpha Epimenis Drury. Part ii. contains coloured figures of no less than twenty-one additional species, many of them new and rare. The price of each part is only one dollar, or with plain instead of colored plates, seventy-five cents. (Address:—R. H. STRETCH, P.O. Box 1802, San Francisco, Cal.)

The third work to which we desire to draw attention is entitled "Lepidoptera, Rhopaloceres and Heteroceres, Indigenous and Exotic; with descriptions and coloured illustrations, by Herman Strecker," Reading, Pa. It is the intention of the author to issue the work in monthly parts, each containing one plate. As yet we have received only the first number, which illustrates a new species of Emperor Moth, *Platysamia Gloveri* Strecker, and exhibits both male and female of the insect, with upper and lower surfaces. The price of each part is but fifty cents.

We sincerely trust that all these handsome publications will meet with such hearty support from the entomologists of America as will encourage their public spirited authors to carry them on till the work is fully completed.

MISCELLANEOUS.

PRIZES FOR INSECT COLLECTIONS AT THE APPROACHING EXHIBITIONS.—We are glad to observe that so much appreciation is shown of the value of Entomology in the formation of the prize lists of our various exhibitions throughout the Province. At the Provincial Exhibition, to be held in Hamilton Sept. 23—27, the following prizes are offered:—

"Collection of Native Insects, with common and technical names attached, and classified so as to show those injurious and those beneficial to Agriculture and Horticulture; 1st Prize $15; 2nd do $10."

At the Western Fair, to be held at London Oct. 8—11:—"Collection of Native Insects, with common and technical names attached; 1st Prize $10; 2nd do $8; 3rd do $4.

"Collection of Native Insects, with common and technical names attached, injurious to field crops and fruits; 1st Prize $6; 2nd do, $4.

"Collection of Foreign Insects, with common and technical names attached; 1st Prize $6; 2nd do $3."

At the Central Exhibition, to be held at Guelph Oct. 1—4:—"Collection of Native Insects, common and technical names attached; 1st Prize $7; 2nd do $4.

"Collection of Native Insects, common and technical names attached, injurious to field crops and fruits; 1st Prize $7; 2nd do $4."

HYPERCHIRIA VARIA.—The remarkable larva described by me in the CANADIAN ENTOMOLOGIST, Vol. II., 28, is that of *Hyperchiria varia*, Walk. I have in my collection specimens of *Macaria liturata* (of Europe) collected at Jamaica Plains in June and July.—C. S. MINOT, Boston.

MOTHS AT SEA.—Captain Robert Fuller, of the S. S. Northumbria, informs me that last September, when about twenty miles off Oporto, "weather fine," a very considerable number of moths made their appearance during the evening, and settled on the masts and sails of the ship by hundreds. So numerous were they, that with one grasp of the hand you could secure four or five moths. Several specimens were caught for me; but until yesterday I had not been able to see them. They all prove to be our common Plusia Gamma; and Capt. F. told me he did not observe any other kind on that occasion. These must have been part of a large flight, as he described them as clustering in masses all over the ship. I certainly think that many of the rare insects occasionally captured round our coasts are brought here in the above manner: after a long and almost exhausting flight over the sea, they very often gain foothold on some passing vessel, and some day or two may elapse before they again take wing; then it may often happen to be near the English coast; the fugitive possibly captured, and dubbed an English specimen, worth a considerable sum, of course. These particular insects, P. Gamma, are most common here; but it is just as likely to happen to a continental species. Doubtless we owe many of our present extensive list of new species to homeward-bound shipping.—*W. H. Tugwell, in Newman's Entomologist.*

ADVERTISEMENT.

TRINITY COLLEGE SCHOOL, Port Hope, Ont.—*Visitor*:—The Lord Bishop of Toronto; *Head Master*:—The Rev. C. J. S. Bethune, M.A.

The course of instruction includes all the usual branches of a sound education in Classics, Mathematics, English, German, French, Natural Science, Book-keeping, Drawing and Vocal Music.

FEES:—Board and Tuition, $220 per annum. Michaelmas Term will commence on *Thursday, Sept. 19th.* For further information apply to the Head Master.

The Canadian Entomologist.

VOL. IV. LONDON, ONT., SEPT, 1872. No. 9

NOTES ON THE EGGS AND YOUNG LARVÆ OF MELITÆA HARRISII.

BY W. SAUNDERS, LONDON, ONTARIO.

For several years past, I have tried to obtain eggs from this species by confining the females in small boxes, but without success until this year, when several of these insects were taken during the third week in June, and shut up in boxes and laid aside. They were unfortunately overlooked until the 5th of July, when in one box was found a cluster of 14 eggs which were about hatching, and in another 31 in one cluster, and three detached ones near it. Those in the latter box had not been so long laid, and their colour was unchanged, and from them the following description was taken :—

Length $\frac{1}{20}$ of an inch, width $\frac{1}{30}$ of an inch. Colour green, of rather a pale shade ; nearly barrel-shaped, contracted towards the upper end, which has a nearly flat or slightly concave smooth surface. The sides are ornamented with a series of sixteen raised striæ placed at regular intervals, and the bottom end is somewhat flattened, and attached firmly to the surface of the box.

The other lot of eggs, which were just about hatching, had lost their green colour, and presented a whitish hue around the sides and towards the bottom ; while the upper portion was dark brown, from the colour of the young larva showing through the transparent egg-shell. While examining one of the eggs under the microscope, one of the mandibles of the enclosed larva was thrust through the egg-shell near the upper surface, and soon after the other appeared near by in the same manner, and after some effort these were made to meet, and then shortly a small opening made, which admitted of the head being partly thrust through, when the larva soon began to eat the egg around, with the view of removing the top. The thickened striæ of the egg were not ruptured without much effort, the points of the mandibles being thrust through the interspaces, and the thicker ridge grasped and torn, after many endeavours, by pulling inwards. As the opening progressed, the sides continued to be eaten down sufficiently to admit of the head being thrust through, the thinner

interspaces being easily disposed of. After tearing through two or three of the striæ, the larva rests awhile from its efforts, and then begins afresh. On the upper flat surface there appears a black forked line, which varies in different specimens, which is caused by the diverging lines on the front of the head showing through; the lines varying as the position of the head is changed. After one hour and thirty-five minutes had been spent in these efforts (including frequent rests), the top was gnawed nearly around, when the head was pushed up, and the lid tilted over. The larva now rested for about ten minutes, although there was no obstacle to its egress, and then commenced to extricate itself, by first bending its head backwards and forwards, and stretching upwards. The second segment, with the first pair of feet, was soon extricated; the feet were placed on the side of the egg-shell, and thus a foothold gained by which to help to withdraw the third segment with the second pair. In like manner the fourth segment was soon extricated; then working its body from side to side with the head upwards, and alternately working it round with the head downwards, grasping with its jaws at adjoining eggs, or anything else within reach, the remaining segments were speedily withdrawn, the whole operation not occupying more than five or six minutes.

Description of young larva fresh from the egg :—

Length about $\frac{1}{16}$ of an inch, cylindrical.

Head large, rounded ; colour dark greenish-brown, nearly black, with a forked line in front like an inverted Y, the diverging lines uniting a little above the middle, and the single line continued to the tip.

Body above dull pale yellowish, each segment with a transverse row of slightly darker raised dots, each emitting a single pale brown moderately long hair ; on terminal segment is a yellowish patch above.

Under surface similar to upper ; feet pale, semitransparent ; prolegs pale yellowish.

Not knowing the food plant of this species, I tried the larvæ, in vain, on a great variety of plants and shrubs, including violet, pansy, willow, grass, clover, polygonum, and purslane, changing the food about every two or three hours for about two days and a half, by which time all but three had died of starvation. Then on examining "Abbot's Notes on Georgian Butterflies," as published by Mr. Scudder, CAN. ENT., vol. 4, p. 85, I found that the larva of *ismeria*, a closely allied species, feeds on *Helianthus*. No time was lost in procuring some common sunflower

leaves, of which the three remaining weakened specimens at once began to eat; two of them soon became plump and active, but the other died.

After the first moult, the following description was taken:—

Length ⅛ of an inch. Head medium size, dark brown: second segment pale on its anterior edge, brown behind, third segment brown also, the remainder of body being very pale brownish, with several round greenish-white spots on each segment. There is also, on each segment, a transverse row of pale slightly raised dots, from each of which arises a single brownish hair.

By the 16th of July, the larvæ had again moulted, and had now grown to a quarter of an inch in length, and were thus described:

Head small, bilobed, black and shining, with a few short pale brownish hairs.

Body above brownish-black, dotted and spotted with greenish. Second segment with a transverse row of tubercles, from which arise brown or blackish hairs. Third and fourth segments each with four black branching spines; spines and branches all nearly black. From fifth to twelfth inclusive, each segment has six spines, the two upper pairs of which are black, tipped with greenish, and with a little greenish colour at base, the fine hair-like branches being black or brown. The lower pair of spines are set in a band of pale greenish-white; where they partake of the same colour, both spines and branches, and this greenish-white stigmatal band, has a broken brownish line running through it. On twelfth segment is an additional dorsal spine, placed a little behind the others; terminal segment with four spines arranged in two pairs, one above the other.

Under surface paler and greenish. Feet tipped with black; prolegs pale semi-transparent.

Soon after this date, one of these larvæ escaped from confinement, and could not again be found; the other soon ceased feeding, and became lethargic, and still continues so, but whether alive or dead now I can scarcely tell, although I fancy it is still living. From the observations of Mr. Scudder on *Argynnis bellona*, published in the September number of the *American Naturalist*, and also from remarks made in correspondence by Mr. Edwards, who has closely watched many members of this interesting family, as well as from my own observations, it seems highly probable that most, if not all of our species of both *Argynnis* and *Melitæa*, pass the winter in the larval state, the larvæ becoming lethargic while quite young.

LIST OF THE

NORTH AMERICAN SPECIES OF CATOCALA.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

The present list is based upon a paper on the genus *Catocala* recently published in the Transactions of the American Entomological Society. The sequence of the species there adopted is here retained, with an unimportant change in a single instance for convenience of reference. The species are grouped according to the colour and design of the hind wings. Such an arrangement must, to a certain extent, be arbitrary, yet little violence seems to be done to the general affinities of the species by its adoption in this genus. With regard to the position of the species with black hind wings, it must be conceded that they are most nearly allied to the species with yellow secondaries. For instance, *C. epione* resembles *C. consors; C. Robinsonii, C. habilis*, etc. But I inaugurate the genus with the black winged species from the consideration that such species are not found in other continents, and that in North America the genus attains its fullest representation. I allow them to precede the more typical specific forms, such as certain of the red winged species, and conclude with the yellow winged *Catocalæ*, as has been customary with regard to the European species. From the Atlantic district we have at least one strictly representative species. This is *C. relicta*, which represents the European *C. fraxini* in our fauna. But I do not know *C. Walshii*, and thus have not been able to decide upon the degree of relationship between the red winged species of the two Continents.

In the following list, the names of species not known to me in nature, are followed by a dash (—). Those hitherto found in Canada are preceded by an asterisk (*). Mr. Saunders has kindly enabled me to add to the number of species hitherto known to me from various points in Canada. The Californian and Texan species are separately indicated; the rest are from the Atlantic district. I have not cited Mr. Walker's erroneous determinations in this genus, elsewhere pointed out, from a desire to avoid increasing the synonymy. While our collections from the Territories are as yet scanty, we must expect the discovery of many new species of the genus. Of the fifty-nine (59) here enumerated, ten (10) are known to me only by description. In the State Collection in St. Louis, I have been shown a specimen of *C. Robinsonii* taken in Missouri.

CATOCALA, *Ochsenheimer*.

1. Hind wings black and unbanded above with blackish fringes.
   INSOLABILIS, *Guenee*.
2. Hind wings black and unbanded above with white fringes, sometimes interrupted with black.
   *EPIONE, *Westwood*.
   Noctua epione, Drury.
   LACHRYMOSA, *Guenee*.
   ROBINSONII, *Grote*.
   *VIDUATA, *Guenee*.
   Catocala vidua, Guenee.
   DESPERATA, *Guenee*.
   Phalæna vidua, Smith.
   RETECTA, *Grote*.
   FLEBILIS, *Grote*.
   TRISTIS, *Edwards*.
3. Hind wings black above, with a white band.
   *RELICTA, *Walker*.
4. Hind wings various shades of red above, with a black median band.
   CALIFORNICA, *Edwards*. (California).
   STRETCHII, *Behr*.— (Virginia city).
   *BRISEIS, *Edwards*.
   ADULTERA, *Hinze*.— (California; *teste Lederer*).
   IRENE, *Behr*.— (Ft. Tejon).
   *UNIJUGA, *Walker*.
   JUNCTURA, *Walker*.
   WALSHII, *Edwards*.—
   *PARTA, *Guenee*.
   COCCINATA, *Grote*.
   *ULTRONIA, *Guenee*.
   Eunetis ultronia, Hubner.
   *AMATRIX, *Guenee*.
   Lamprosia amatrix, Hubner.
   Catocala selecta, Walker.
   var. *Catocala nurus*, Walker.
   *CARA, *Guenee*.
   *CONCUMBENS, *Walker*.
   MARMORATA, *Edwards*. (Ureka).

*ILIA, *Guenee.*
Phalaena ilia, Cramer.
UXOR, *Guenee.*—
(an spec. praec. ?)

5. Hind wings orange above with a median black band.
ZOE, *Behr.*— (Searsville).
INNUBENS, *Guenee.*
var. *Catocala scintillans, G. & R.*

6. Hind wings black above, with a narrow even yellow band.
*CEROGAMA, *Guenee.*

7. Hind wings yellow above, with a median black band.
*NEOGAMA, *Guenee.*
SUBNATA, *Grote.*
PIATRIX, *Grote.*
PALAEOGAMA, *Guenee.*
var. *Catocala phalanga*, Grote.
HABILIS, *Grote.*
CONSORS, *Guenee.*
Phalaena consors, Smith.
PONDEROSA, *G. & R.*
Catocala nebulosa, Edwards.
MULIERCULA, *Guenee.*
BADIA, *G. & R.*
*ANTINYMPHA, *Walker.*
Noctua paranympha ‡ Drury.
Ephesia antinympha, Hubner.
Catocala affinis, Westwood.
Catocala melanympha, Guenee.
SERENA, *Edwards.*
ILLECTA, *Walker.*
*CLINTONII, *Grote.*
NUPTIALIS, *Walker.*—
ABBREVIATELLA, *Grote.* Texas.
FREDERICI, *Grote.* Texas.
MICRONYMPHA, *Guenee.*
*POLYGAMA, *Guenee.*
AMASIA, *Westwood.*
Phalaena amasia, Smith. (Upper figure).

FORMULA, *G. & R.*
Phalaena amasia, Smith. (Lower figure).
CONNUBIALIS, *Guenee.*—
GRYNEA, *Walker.*
Catocala nuptula, Walker.
*PRAECLARA, *G. & R.*
FRATERCULA, *G. & R.*
*MINUTA, *Edwards.*
var. *Catocala parvula*, Edwards.
GRACILIS, *Edwards.*
Catocala similis, Edwards.

8. Hind wings yellow above without a median band.

*ANDROPHILA, *Guenee.*
Corisce amica, Hubner.
LINEELLA, *Grote.*
MESSALINA, *Guenee.*

PHYLLOXERA VASTATRIX IN PORTUGAL.

The *Gardeners' Chronicle* of the 20th inst. records a meeting of the Scientific Committee of the Royal Horticultural Society on the 17th inst. The following communication formed part of its proceedings:—"From the Foreign Office came a copy of a communication from Her Britannic Majesty's Consul at Cintra, alluding to the appearance of the new Vine disease in Portugal; one vineyard, producing an average quantity of 70 pipes, last year only produced one pipe, the total loss in the Douro district being estimated at 500 pipes." In connection with this communication, it appears desirable to mention that a trade circular of the 12th inst. directs attention to a pamphlet from Oporto, published in June last (by Ernesto Chardron, Rua dos Clerigos), which treats at length of the same insect pest. This pamphlet, although it adds no new facts to the natural history of *Phylloxera vastatrix*, as ascertained by Westwood, Planchon, Lichtenstein, and Riley, has the merit of giving the locality where the insect first appeared in Portugal. It appeared first in the parish of Gouvinhas, where its ravages have been so great that one quinta, planted in 1842, producing in ordinary years 50 pipes of wine, was reduced in 1870 (otherwise a good year) to two pipes only.

The question arises, how did the *Phylloxera* first reach Portugal? It seems to me that there are only two likely means of conveyance in this instance. It must have got there, either in the egg or larval state, on canes imported from abroad. Or if such has not been the case, I presume winged gravid females have been carried from the infected districts of France into the vineyards of the Alto Douro; or perhaps the last-named locality has served as starting place for the French "Vignobles," after the presumed arrival of the insect from America.

England, France, and Portugal are now infested; how long Spain will remain free from the plague no one can say. Lately the *Phylloxera* has made its first appearance in Switzerland, in the cantons of Argovie, Schaffhousen, Zurich, and Thurgovie; and there can be now but little hope that the Rhine and the Moselle districts will escape much longer.

The fact of the matter is, that even leaving Nature's own operations out of the question, the trade and exchange of choice varieties of hothouse Vines and hardy seedlings are now so extensive, that man is the real carrier of the pest.

Is it asking too much to call for international co-operation in the checking of the plague, universal as it is sure to become? One would think that the threatened destruction of wine-growing all over Europe and America is an evil, not only to the nations concerned, but of universal consequence. Governments there are which are enlightened enough to offer enormous prices for a sure remedy to destroy the insects; but why not fight the enemy *ab ovo*, by strictly ascertaining and confining its depredations to its present centres of dispersal and eradicating it there? Much might be done by stopping the distribution of canes and seedlings from countries at present occupied by the *Phylloxera*.

If some such measure were adopted on international grounds by all countries concerned, one fruitful source of propagation would be closed up. Local energy might then be applied to the task of overseeing the districts attacked, and doing battle with unforseen arrivals in fresh localities.

Means have been found effectually to stop the importation of domestic animals affected by certain diseases. Surely rules could be devised to bar the distribution of cultivated plants when found to be accompanied by their insect foes.

It is the plain interest of the viticulturist, as well as that of the public, to agitate until protective international measures are taken in this grave

matter; and I feel convinced that future generations will honour the State which takes the lead of a movement to counteract a disease of such alarming influence over the prosperity of a widely spread and, until lately, remunerative culture.—ALBERT MULLER.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 150.

GELECHIA.

This huge genus comprehends insects of great variety of size and structure, but unfortunately it has not yet been found practicable to subdivide it. It contains, no doubt, material for several genera, and for the convenience of the student, if for no other reason, its subdivision is *the* desideratum in microlepidopterology. The young student who finds a micro with the palpi simple or but scarcely at all thickened with scales beneath, the fore wings comparatively narrow, and the hind wings deeply excised beneath the tip, and is told that it is a *Gelechia*, may well be astonished when he finds a larger insect, with the hind wings not at all excised beneath the tip, and the palpi overarching the vertex, with a large brush beneath the second joint, which may even present some appearance of longitudinal division, and is told that it, too, is a *Gelechia*. Several of the species which I have placed provisionally in *Depressaria*, some entomologists would, no doubt, place in this genus. The species hereinafter described belong, with two or three exceptions, unquestionably to *Gelechia*. Possibly, the entomology of other localities may furnish the connecting links between these species and those that I have placed in *Depressaria*, but I have not met with the connecting links, and the two groups of species seem to me to be as essentially distinct as *Gelechia roseosuffusella*, Clem., or *G. Hermanella*, Stainton, are from *Depressaria albipunctella*, as figured by Stainton. A few of the species, however, described below, do not belong to the group represented by *G. roseosuffusella*; but to those having a small brush on the second joint of the palpi.

G. thoracochrella. N. sp.

Second joint of the palpi with a small but distinct brush; palpi dark brown, ochreous along the inner surface and the second and third joints tipped with ochreous; apical half of the tongue yellowish; antennæ

annulate with ochreous and brown; head silvery, tinged with pale purple and flecked with dark brown; *thorax ochreous;* anterior wings dark grayish brown, with darker brown spots and somewhat sprinkled with ochreous. *Alar ex.* $\frac{9}{16}$ inch. Kentucky, in June.

At first glance this species is likely to be mistaken for *G. fuscopulvella post*, but it is much darker in color and the reddish-ochreous thorax also distinguishes it.

G. obscurella. N. sp.

Palpi much thickened beneath, almost brush like; palpi dark brown, mixed with ochreous; ochreous on the internal surface, and extreme tip of third joint ochreous; head silvery with a faint purple tinge, and flecked with brown; antennæ annulate with ochreous and brown; thorax and anterior wings ochreous, densely flecked with dark brown, in some lights showing a very faint roseate tinge. *Alar ex.* $\frac{9}{16}$ inch. Kentucky, in June.

This species also might, on a casual glance, be mistaken for *fuscopulvella post*, but the absence of anything like distinctness or definite form in the markings of the wings distinguishes it. It is a very plain and inconspicuous insect.

G. fuscopulvella. N. sp.

Second joint of the palpi almost forming a brush, externally dark brown, with dark ochreous intermixed, internally pale ochreous; terminal joint dark brown, with an almost equal quantity of yellow ochreous, intermixed; antennae alternately annulate with ochreous and brown; head and anterior wings dark yellowish-ochreous, dusted with dark brown, and with a faint roseate tinge, the apical portion being about equally ochreous and dark brown. There are three distinct dark brown costal spots, the second of which is about the middle; the first is most distinct, and is connected with some irregular dark brown streaks on the disc. See *G. thoraceochrella ante. Alar ex.* $\frac{9}{16}$ in. In Kentucky in June.

G. fuscomaculella. N. sp.

Palpi with the second brush scarcely brush-like, ochreous and fuscous, mixed in about equal qualities, tipped with pale ochreous; head ochreous, dusted with brown; thorax brown; anterior wings dusted with brown, which is aggregated into irregular spots and blotches. *Alar ex.* ½ inch. Kentucky.

G. quercinigracella. N. sp.

Ochreous-gray; *second joint of the palpi not at all brush like, but somewhat thickened or incrassate towards its apex beneath;* palpi dark brown,

with a little ochreous intermixed; third joint annulate with pale ochreous at the base, middle and tip; head ochreous-gray; antennae with alternate annulations of dark brown and pale ochreous; thorax and anterior wings ochreous-gray. There is a brownish patch at the base of the wings, an oblique dark brown streak from the costa, not far from the base, crossing the fold, but not quite reaching the posterior margin; extreme costa dark brown, a dark brown costal spot about the basal third, another larger one about the apical third, the wing between the latter and the dorsal margin being overlaid with dark brown; apical portion of the wing densely dusted with dark brown; ciliae gray, with some intermixture of dark brown scales. *Alar ex.* ½ inch. Kentucky.

The larva is slender, white, with a black spot behind each eye, and two small black ones, one above the other, on each side of each segment. Later in larval life, the black spots on the first segment spread, and cover the posterior margin of the segment, becoming confluent on top; and the larva becomes dirty yellowish, with small black spots on each segment, and the space between the segments (or rather where the segments pass into each other), becomes suffused with pink. It feeds on the leaves of the "Black Jack" *(Quercus nigra)* in the latter part of June and in July.

G. grisella. N. sp.

Gray, densely dusted with dark brown, base of the costa dark brown; head but faintly dusted; antennae dark brown; palpi with the second joint densely clothed beneath, but scarcely brush-like, dark brown externally, with a white annulation near the apex of the second joint, and another at the base of the third. *Alar ex.* $\frac{7}{16}$ inch. Kentucky. Imago in May.

G. albistrigella. N. sp.

Second joint of the palpi but slightly thickened beneath towards the apex. Entire insect (except as stated below) dark brown in some lights, faintly tinged with purple, green, or bronze; a small oblique white costal streak just before, and a few indistinct whitish scales or small spots in the apex, near the dorsal ciliae; ciliae pale fuscous, with a dark brown hinder marginal line before their middle. *Alar ex.* ⅜ inch. Kentucky, in June.

The wings are not spread in my single specimen, and I have not examined the neuration. It is rather a pretty species, which in its general appearance and style of ornamentation, seems to approach *Strobisia*, Clemens.

G. suffusella. N. sp.

Second joint of palpi slightly incrassate beneath towards the apex; both

joints silvery white, with a fuscous band before the apex of the second, and with two fuscous annulations on the third, and extreme apex fuscous; head pale ochreous; antennae with alternate ochreous and brown annulations; anterior wings pale ochreous, suffused near the base with pale fuscous, behind which is an oblique pale band across the wing, and behind that an oblique fuscous band, behind which the wing is paler again, with another large pale fuscous patch before the beginning of the costal ciliae, and the apex dusted with fuscous; the whole wing is suffused, according to the light, with roseate, silvery, pale golden or pale green; the golden tinge is most distinct along the dorsal margin. *Alar ex.* $\frac{3}{8}$ inch. Kentucky, in May.

G. discomaculella. N. sp.

Second joint of the palpi but little thickened beneath; palpi dark brown, with dark ochreous intermixed. Antennae brown; anterior wings gray, densely dusted with brown, the dusting more dense towards the apex, with a small triangular ochreous patch at the beginning of the costal ciliae, and a small one opposite on the dorsal margin. *In some lights, two minute golden spots are visible, one about the midde, and the other about the end of the disc.*

Alar ex. $\frac{3}{8}$ inch. Kentucky, in May.

G. aurimaculella. N. sp.

Very near the preceding species but distinct, I think. Second joint of the palpi dusted with white, third joint but little dusted, both joints brown; head silvery, dusted with dark brown, and with metallic hues; thorax and anterior wings pale ochreous, almost whitish, mixed in about equal quantity with dark brown, which in places is aggregated into patches and which forms an oblique fascia about the basal fourth of the wing; apical half of the wing mainly dark brown with a white costal spot at the beginning of the ciliae and a smaller opposite dorsal one; *On the disc are three minute and indistinct golden yellow spots or streaks. Alar ex.* $\frac{7}{16}$ inch. Kentucky, in June.

G. ? curvilinella. N. sp.

Palpi simple, pale gray mixed with brown; antennae pale gray, annulate with brown; head, thorax and wings dusky gray, sprinkled with hoary; a hoary spot on each side of the thorax above the wings; two or three indistinct, dusky, longitudinal short streaks on the wings, the most distinct of which is on the fold before the middle. *In some lights there is a tolerably distinct curved or zig-zag line beginning at the base of the wing,*

passing thence to the costa, thence to the fold and backwards and forwards from the costal margin to the fold, to about the apical fourth, where it suddenly curves up to the dorsal margin at the beginning of the ciliæ. In some lights this line is invisible. *Alar ex.* ⅜ inch. Kentucky, in May.

G. Physaliella. N. sp.

Second joint of the palpi a little incrassate beneath. Lower face creamy yellow; palpi, head, thorax, and anterior wings dark brown, a little bronzed, rather indistinctly dusted with ochreous, and still more indistinctly with white. *Alar ex.* ⅜ inch. Kentucky.

The larva mines the leaves of the "Ground Cherry" *(Physalis Viscosa)* in September, and perhaps earlier, as I found there many empty mines. It mines the under surface, and produces a tubicular swelling of the upper surface. It pupates among leaves on the ground, and (in the breeding cage at least) the imago conceals itself among the leaves and "trash" on the ground. I have never seen any specimens except the two that I succeeded in rearing; but the mines are abundant. The following are my notes about the larvae:—"Larvæ now (Oct. 6th) about ¼ inch long; one of these in the mine appears bright bluish-green, with the head yellowish; another is pale bluish or bluish-green, almost white, suffused with pink upon the back, head pale brownish. Oct. 7, one of them has left the mine; it is ¼ inch long, robust, deep purple, with the head and 'shield' of the first segment green. Two imagines April 14." They were kept in a warm room.

G. quercivorella. N. sp.

Second joint of the palpi slightly incrassate beneath. Palpi very dark brown, mixed in almost equal proportion with white. Head white, rather sparingly flecked with dark brown. Antennæ dark brown, annulate with white; thorax and anterior wings dark iron gray, with a blackish costal spot about the middle of the costa, and another smaller one at the beginning of the ciliæ, and with other irregular and irregularly disposed dark brown spots on the wing; the dorsal margin paler gray. Hind wings of a leaden hue, faintly tinged with purplish. *Alar ex.* ⅜ inch. Imago in June in Kentucky.

The larva is white with bright red spots, closely resembling that of *G. Hermonella.* It feeds on Oak leaves, and when first observed, was forming a closely-fitting tube of white silk around itself on the under side of the leaf. This tube it closed in a day or two after, and by some means spun a band of brown silk across the middle of it on the outside.

G. longifasciella. Clem., Proc. Ent. Soc. Phila., 1863, p. 12.
Telphusa curvistrigella, ante p. 133.

After my former paper was in the hands of the printer, I became satisfied that the species which I had made the type of this genus could be nothing else than *G. longifasciella*, Clem. It was discovered unfortunately too late to prevent the publication of the species as *Telphusa curvistrigella.* The genus *Gelechia* has become so large and unwieldy, and contains such a variety of size, ornamentation and structure, that the temptation is great to put every thing that will admit of it in another group. If this species had not been before described, I think I should permit it to remain as the type of the new genus *Telphusa*, as I placed it in the preceding number. But as Dr. Clemens (a better entomologist by far than I claim to be), has placed it in *Gelechia*, and that genus comprehends such a diversity of forms that it may include almost any thing of a certain (or rather uncertain) general structure, and as on further observation I am satisfied that this species really approaches nearer than I had supposed to the true *Gelechia (G. roscosuffusella*, Clem., being my type), I desire to retract my generic and specific names, so that the species will stand as described by Dr. Clemens, *G. longifasciella.* It is not, however, a true *Gelechia* of the *roscosuffusella* type.

G. variiella. N. sp.

White; apical half of the forewings suffused with golden yellow, usually deeply so, sometimes faintly, becoming deeper towards the apex, and with indistinct whitish spots and transverse streaks in the apical part. Four distinct dark brown costo-apical spots at the base of the costal ciliæ. In many specimens there is a small, rather indistinct, brown costal streak just before the ciliæ; a small very oblique dark brown costal streak, placed about the middle of the costa, is continued along the costa towards, and, in many specimens, to the base; sometimes (in perhaps half of my specimens) this streak is absent. In some, the entire costa is dark brown or pale brown; in others, the entire costa is golden yellow; in others it is white. Sometimes the two costal streaks are golden instead of brown, and in these specimens there is a very narrow long and oblique white costal streak behind the two yellow ones in the apical part of the wing. Head and its appendages white, but in some specimens the antennæ are faintly suffused with brown. *Alar ex.* ⅝ inch. Kentucky.

This is an exceedingly variable species; the only constant characters seem to be that the species is white, with more or less of the apical part of the wing golden, with a few dark brown spots at the base of the costal

ciliæ, and with two or three small oblique brown or golden costal streaks. In many specimens there is a circular dark brown spot on the dorsal margin just before the ciliæ. Two or three of the best marked varieties, if taken at different times and in the absence of connecting links, would undoubtedly be considered distinct species. The larva is unknown, and I have met with the imago but once. Then it was swarming in great numbers in the grass and around the trunk of an Elm tree. The space occupied by them did not exceed twenty yards square.

G. obliquistrigella.

Anarsia obliquistrigella, ante p. 65.

G. apicistrigella.

Parasia apicistrigella, ante p. 66.

The neuration of the first of these insects is exactly that of *Anarsia;* that of the second is exactly that of *Parasia.* By attaching too much importance to the neuration, I was induced to place them in these genera respectively. The other characters, however, are those of *Gelechia,* and I have accordingly transferred them to that genus. The second joint of the palpi is somewhat thickened beneath in both.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 155.)

GENUS MACROPS.

Body oblong, winged. Rostrum shorter than the prothorax, subcylindrical, somewhat arched, having a dorsal longitudinal ridge; bed of the scape of the antennæ oblique reaching from near the apex of the nostrum to the middle of the eye; antennæ apical, longer than the head, eleven-jointed; scape as long as the remainder of the antennæ, incrassated at the apex, reaching the eye; two next joints longer than the subsequent ones, obconical; the following four very short, top-shaped; the four last forming a subovate knob; eyes lateral, subimmersed, long, forming, in some measure, an isosceles triangle with the base rounded, and the vertex downwards: prothorax subglobose; antepectus emarginate, sides obsoletely lobed: scutellum very minute, triangular; coleoptera oblong:

thighs unarmed; tibiæ armed with a very minute incurved spine or spur; tarsi not dilated, penultimate joint bipartite.

At first sight the species of this little group would be set aside as belonging to *Sitona* Germer, with which they possess many characters in common; a closer inspection, however, will satisfactorily prove that they belong to different genera. In the genus just named, the rostrum is shorter, thicker, and channelled; the knob of the antennæ consists only of three joints, the bed of the scape turns below the eye; the eye itself is round: the antepectus is not emarginate, or lobed; the tibiæ have no incurved spine.

[200.] 267. MACROPS MACULICOLLIS *Kirby*.—Plate viii., fig. 4.—Length of body 2 lines. Two specimens taken in Lat. 65°.

Body black, rather hoary from decumbent hairs and scales. Rostrum very minutely punctured; ridge reaching from the base to the apex; stalk of the antennæ a dull-red: prothorax minutely and thickly punctured, obsoletely ridged, having the sides, especially at the base, covered with little white scales: elytra furrowed, furrows punctured: tibiæ, tarsi, and base of the thighs of a dull obscure red, posterior thighs on the inside more distinctly rufous.

268. MACROPS VITTICOLLIS *Kirby*.—Length of body 2¼ lines. A single specimen taken.

Body covered with brownish-black scales. Rostrum ridged at the tip, the rest covered with scales, which perhaps conceal the remainder of the ridge; stalk of the antennæ rufous: prothorax with three narrow pale stripes, the lateral ones a little waved: scutellum pale; elytra slightly furrowed; furrows minutely punctured; mottled with pale: tibiæ and tarsi, the former obscurely, rufous.

[201.] GENUS LEPIDOPHORUS.

Body covered with scales. Antennae longer than the head, eleven-jointed; scape as long as the remainder of the antennae, reaching to the eye, growing gradually thicker towards the apex; pedicel as long as the two following joints, obconical; the remaining joints of the stalk rather top-shaped; knob three-jointed, ovate, acute; rostrum shorter than the prothorax, thick, subcylindrical, straight; bed of the scape of the antennae very short, not reaching the eye; eyes subobtusangular, with the vertex downwards: prothorax rather longer than wide, barrel-shaped: elytra taken together oblong-oval: scutellum punctiform: thighs clubbed, unarmed; tibiae armed at the apex with a short incurved spine; penultimate joint of the tarsi bilobed.

269. LEPIDOPHORUS LINEATICOLLIS *Kirby*.—Length of the body 2½ lines. Several specimens taken in Lat 65°.

Body black, underneath hairy with little whitish round scales and hairs of the same colour intermixed. Head and rostrum behind the antennae covered with similar scales: antennae dusky-red: prothorax dusky, confluently punctured with three whitish longitudinal narrow indistinct stripes formed of minute scales: elytra mottled with whitish and dusky round scales; slightly furrowed with punctures in the furrows; at the apex, in the deflexed part, there is a series of white rigid minute bristles between each furrow: legs hairy, reddish brown, thighs darker.

[202.] 270. TRACHYPHLŒUS MELANOTHRIX *Kirby*.—Length of the body 2¾ lines. A single specimen taken in Lat. 65°.

Body really black, but quite covered with a brown powdery substance, resembling mud or dirt. Head impressed between the eyes; rostrum longer than the head, and nearly as wide, emarginate and hairy at the end; antennae rufous, scape covered with brown powder: prothorax transverse, obsoletely channelled, with several short rigid black bristles on each side of the channel arranged nearly in rows: elytra obsoletely furrowed with slight punctures in the furrows, and between each furrow is a row of longer rigid black truncated bristles; a few white ones are discernible at the apex: legs bristly, with white bristles, rufous, but the thighs are covered with powdery scales.

[203.] 271. PACHYRHYNCHUS (RHINARIA) SCHONHERRI *Kirby*.—Length of the body 5—7 lines. Taken in Canada by Dr. Bigsby. Also in Georgia? by Mr. Abbott.

Body thickly covered, especially underneath, with hoary pile. Antennae shorter than the head; eyes brown: prothorax with three faint whiter stripes: scutellum white; elytra with nine rows of punctures, and at the base of the lateral margin is a portion of a tenth row, between the second and third; in the sixth, seventh, eighth, and ninth rows the pile is thicker than in other parts of the elytrum, so as to form three white stripes, on these stripes there are also four rows of distant black dots on each elytrum. [Not uncommon in Canada.]

[204.] 272. ATTELABUS SIMILIS *Kirby*.—Length of the body 2½ lines. Taken in Canada by Dr. Bigsby.

This species is nearly the transcript of *A. curculionoides*, for which I at first mistook it, but a closer inspection convinced me it was distinct. They agree in being black, glossy, and naked; in having a red prothorax and elytra, the latter with several rows of punctures; in having the head

and rostrum more or less punctured, with curved impressed lines on each side just above the eyes, in the disk of the front; the prothorax also in both is minutely punctured, and the cubit arched and internally serrulated. They differ, however, in several respects. In *A. curculionoides* the head is wider in proportion, the occiput black, levigated, with a central impression; the curved lines of the front not distinctly punctured; the stalk of the antennae rufous; the prothorax at the base is streaked with transverse linear impressions; the scutellum is nearly black, and the interstices of the rows of punctures of the elytra are irregularly punctured. In *A. similis* the hinder part of the head which is punctured and wrinkled, and scutellum are rufous, a transverse impression divides the occiput from the front; the curved lines are distinctly punctured; in the front between the eyes is a wide channel; the antennae are piceous; the prothorax is not streaked at the base: and the elytra between the rows of punctures are levigated. [Synonymous with *A. analis* Illig.; taken in Canada.]

273. ATTELABUS BIPUSTULATUS *Fabr.*—Length of the body 2 lines. Taken in Canada, near Lake St. Clair, by Dr. Bigsby.

[205.] In sculpture this species for the most part agrees with *A. curculionoides*, except that there is an impression between the eyes, and a pair on the disk of the prothorax. The whole of the body is very black, except the shoulders of the elytra, which are covered by a large oblong red spot, the anterior thighs are armed with a minute tooth: the disk of the coleoptera, or elytra taken together, towards the base is depressed; and the scutellum is obversely triangular, the vertex of the triangle pointing towards the head. [This and the preceding species are both described and figured in Harris' Injurious Insects, pages 65 and 66; taken in Canada.]

274. APOTOMUS OVATUS *Fabr.*—Length of the body 1¼ line. Variety B taken by Dr. Bigsby near Lake St. Clair.

[206.] Body very short, between pear-shaped and ovate, deep violet, naked, minutely punctured. Head black, rostrum levigated: prothorax somewhat lozenge-shaped, emarginate anteriorly, very thickly and confluently punctured, with a levigated discoidal longitudinal line: elytra furrowed, furrows punctured.

VARIETY B. Blue-green. [Belongs to *Attelabus* Fabr., or *Pterocolus* Sch.]

275. ANTHRIBUS FASCIATUS *Olivier.*—Length of the body 4 lines. Taken in Canada by Dr. Bigsby.

Body black, covered more or less with brown decumbent short hairs. Rostrum angular, thickish, dilated at the tip, below the antennae covered thickly with snow-white decumbent pile; antennae almost as long as the thorax, rufous, knob dusky-brown; front marked with two whitish dots, one adjoining each eye on their upper side: prothorax wrinkled with a transverse discoidal impression, and near the base with an elevated transverse ridge: elytra wrinkled with a discoidal tubercle near the base, near the apex adorned with an irregular angular band composed of snow-white decumbent pile: abdomen whitish with a double indistinct series of black dots; tibiae with a white ring.

VARIETY B. With the tubercles of the elytra less conspicuous; the abdomen snowy-white; thighs variegated with white.

I have no memorandum whence I received this variety. It is smaller, and probably American.

MISCELLANEOUS.

MR. COUPER'S LABRADOR TOUR.—The following notice lately appeared in the *Montreal Herald*:—

"GREAT ENTOMOLOGICAL LOSS.—Mr. Couper, the Canadian Entomologist, who left Montreal on the 10th of May last to collect butterflies and moths in Labrador, has had his splendid collection of rare specimens destroyed by some of the Indians, who took revenge in this way for some statement made by him in the Quebec *Chronicle*, about seven years ago, regarding the destructive practice of the tribe in spearing salmon on the then spawning grounds."

In a recent letter from Mr. Couper, who has returned from Labrador, he confirms this statement. He informs us that "a six weeks' collection, consisting of 36 specimens of *Colias Interior*; 4 species of *Argynnidæ* (100 specimens); 5 species of *Lycænidæ* (200 specimens,) and a quantity of other material, amounting to about 400 in all, were destroyed by Indians, who, I suppose, broke open my trunks, &c. during absence from camp. At all events the destruction took place between Mingan and Seven Islands, on the north shore. The loss was not discovered until I examined the cases after leaving the latter place. I was informed by the lessee of the salmon fishery at Mingan that my life was not safe, as I helped the fishery guardian to prevent the Indians from spearing salmon on the Mingan river, and also wrote as above stated seven years ago. Before I left Mingan, I went to the *Pere* who attends to their spiritual

wants, and he was partly aware of my situation, but there being no schooner going west from the place at the time, he kindly sent me off in a schooner belonging to the Mission, in company with two Indian sailors, who brought me to Bersiamits. I was therefore compelled to leave Mingan about the 20th of July, while I was searching for *Colias interior*, *Argynnis Boisduvali* and *Lycæna Scudderi*. The specimens collected on Anticosti were not with the destroyed collection—they are safe—and are all I can send my subscribers this year, but, if God spares me, it is my intention to return next May to collect the lost species, which can be obtained without going into the section of country occupied by these Indians.

As soon as I send off the material to my subscribers, I will write an article on the Entomology of Anticosti."

We deeply regret to hear of the severe loss Mr. Couper has thus sustained, and cannot but admire his perseverance in determining to revisit these northern districts next year to endeavor to replace his lost material. We sincerely hope he will be eminently successful. We also hope soon to be able to furnish our readers with the promised paper from Mr. Couper's pen.—ED. C. E.

LIBYTHEA MOTYA.—I captured on the 2nd of September, near Hoboken, N. J., a *Libythea motya* (Bois & Lec,) at least I presume it to be that species, that being the only one given to the U. S. in Kirby's new Catalogue. I should be glad to learn through the columns of the CANADIAN ENTOMOLOGIST in what portions of North America this butterfly has been found. The specimen captured by me is very close to *L. Myrrha* (Godt.,) the habitat of which is the East Indies. It is, however, somewhat smaller. W. V. ANDREWS.

The insect described by Dr. Kirtland as *L. bachmanii* is probably a variety only of *L. motya* of B. & L. This has been taken in Ohio, and also at Hamilton, in Ontario. It has also been received by us from W.H. Edwards, Esq., of West Virginia.—ED. C. E.

ADVERTISEMENT.

TRINITY COLLEGE SCHOOL, Port Hope, Ont.—*Visitor*:—The Lord Bishop of Toronto; *Head Master*:—The Rev. C. J. S. Bethune, M.A.

The course of instruction includes all the usual branches of a sound education in Classics, Mathematics, English, German, French, Natural Science, Book-keeping, Drawing and Vocal Music.

FEES:—Board and Tuition, $220 per annum. Michaelmas Term will commence on *Thursday, Sept. 19th*. For further information apply to the Head Master.

The Canadian Entomologist.

VOL. IV. LONDON, ONT., OCTOBER, 1872. No. 10

THE AMERICAN ASSOCIATION.

The *twenty-first* meeting of the American Association for the Advancement of Science was held at Dubuque, Iowa, in the month of August last, commencing on the 21st and closing on the 27th inst. As regards the attendance and number of papers read, the meeting was certainly quite up to the average, but in scientific interest and value we cannot think it comparable to many in previous years. This deficiency was owing very largely, no doubt, to the change of locality almost at the last moment, viz., from San Francisco to Dubuque—the shores of the Pacific to the banks of the Mississipi. Several leading scientific men in the eastern States, finding the time and expenditure necessarily required for a visit to California beyond what they could well afford, had made other arrangements for the employment of their summer holiday, which the late change of place gave them no opportunity of altering. Others again, notably Prof. Agassiz and his party, were absent from the country, and could not in any case have taken part in the proceedings. Hence the meeting was shorn of many of its usual attractions, and has failed, we think, to leave any very decided mark upon the scientific annals of the country.

While the meeting was thus defective in one point of view, it certainly was a great success in another. *Socially*, it left nothing to be desired. The kindness and hospitality of the good people of Dubuque was so universal and unvaried, that all must have thoroughly enjoyed their visit, even though it was not especially distinguished by gorgeous receptions and gay fashionable entertainments, such as have sometimes rather interrupted the proper proceedings of the Association in cities of greater size and wealth.

We do not propose to give a detailed history of the meeting, or a particular account of the papers read; the former can be obtained by those desiring it in the current issues of many leading newspapers, especially those of Dubuque, Chicago, and New York; and the latter will no doubt be furnished, as usual, in the pages of the excellent *American Naturalist*, as well as in the Annual Transactions of the Association. We shall merely regard the meeting from an Entomological point of view—the most interesting, probably, to the majority of our

readers. Before proceeding to do so, however, we must not omit to draw special attention to what was really the grand feature of the meeting—the retiring President, Professor Gray's, able and most interesting address, and to recommend its perusal to all our readers.

The only entomological paper read in Section B, "Natural History," was a very interesting one by Mr. C. V. Riley, on "The Fertilization of the Yucca Plant by *Pronuba Yuccasella*;" it was listened to with marked attention, and was followed by an animated discussion, in which Prof. Gray, Mr. Morse and others took part. It will, we believe, be published very shortly by the author, but meanwhile we may give a base outline of its leading features. It appears that the American Yuccas possess flowers so peculiarly constructed, that it is impossible for the pollen to reach the stigma, and consequently they depend upon artificial means for their fertilization. Mr. Riley has discovered that the "marriage priest" is a small white moth, hitherto unknown to science, which he has named *Pronuba Yuccasella*, and considers the type of a new genus. The most remarkable feature in the insect is that the female (not the male) has the basal joint of the maxillary palpus developed in a most extraordinary manner into a long curved tentacle furnished with spines. With this process the insect collects the pollen and conveys it to the tube of the stigma, which it could not otherwise reach; she then lays her eggs, the larvæ from which feed upon the seeds of the Yucca fruit. The larva escapes to the ground when full grown, and passes the winter there in a silken cocoon. Mr. Riley remarked that in the more northern portions of America, where the Yucca had been introduced for the sake of its ornamental flowers, it never bore seed on account of the absence of this insect; by the introduction of this moth, however, the defect might without difficulty be remedied.

A matter of much interest to the entomologists present, and which will probably prove of importance hereafter, was the formation of an Entomological Sub-section. On Saturday, the 24th of August, during the general meeting of the Association, a notice was read requesting those interested in this department of Natural History to meet together at the close of the morning session for the purpose of consulting together respecting the organization of a Sub-section. At the time appointed, the following members were present: Rev. Dr. Morris, of Baltimore, Md.; Mr. C. V. Riley, St. Louis, Mo.; Dr. G. M. Levette, Indianapolis; Mr. O. S. Westcott, Chicago; Rev. C. J. S. Bethune, Port Hope, Ont.; Mr. W. Saunders, London, Ont., and Miss M. B. Norton, Rockford, Ill.

Dr. Morris was unanimously elected Chairman, and Mr. Saunders Secretary. It was then moved by Mr. Bethune, and resolved, that "if it be found necessary, the Chairman and Secretary be requested to communicate with the Standing Committee of the Association, with a view to the organization of an Entomological Sub-section." The following gentlemen were appointed members of the provisional Committee of the Sub-section: Rev. C. J. S. Bethune, Messrs. C. V. Riley, and O. S. Westcott. The meeting then adjourned till 7 o'clock p.m.

At the evening meeting there were present, in addition to those mentioned above, Messrs. H. H. Babcock, Chicago; M. S. Bebb, Fairmont, Ill.; J. H. Blodgett, Rockford, Ill.; H. C. Warner, Claremont, Iowa, and C. M. Weatherby, Dubuque, Iowa.

The Chairman having announced that it would be necessary to obtain the consent of the Standing Committee before a Sub-section could be legally organized, it was resolved that the Secretary be requested to inform the Permanent Secretary of the Association that it is deemed desirable by the entomological members that a Sub-section of Entomology should be formed in Section B.

It was then moved by Mr. Riley, and resolved, that a committee be appointed to draft a set of rules for adoption at the next meeting of the Association on the subject of entomological nomenclature. The Chairman nominated the following committee:—Messrs. Riley, Bethune, Packard (Salem), Saunders and Morris.

The meeting then proceeded to discuss the "Revision of American Butterflies" recently put forth by Mr. S. H. Scudder, in advance of his forthcoming work on the Butterflies of North America. There was a unanimous expression of regret and disapprobation on the part of those present at the wholesale and radical changes proposed by this distinguished author in the generic and specific names of the butterflies of this Continent. The feeling was manifested by all, that changes so radical and so sweeping in the received nomenclature were uncalled for, and would prove of great detriment to the study and popularity of this department of entomology. The hope was strongly expressed by all, that Mr. Scudder would reconsider his proposed changes before the publication of his great work, which is looked forward to with so much interest by all lepidopterists, and not mar to a great extent its usefulness, or injure its general acceptance.

The meeting then adjourned. At the general meeting of the Association on the following Monday, a recommendation was brought forward

by the Standing Committee to the effect that the formation of a Sub-section of Entomology in Section B be authorised by the Association, and the necessary amendment to the Constitution be brought up for adoption at the next annual meeting. This recommendation was unanimously adopted by the meeting, and will no doubt be ratified next year; we may, therefore, look upon the "Sub-section of Entomology" as an accomplished fact. We trust that our readers will now do what in them lies to make it a useful and attractive portion of the Association, and not allow so good a vantage ground to be lost by apathy and indifference. We would venture to suggest to the Committee that they should, at an early date, announce some special department of entomology to be taken up by the meeting next year, in addition to any subjects that may be brought into discussion by the papers of individual members. Such a plan, though not perhaps quite in accordance with precedent, would, we think, add value and attractiveness to the meeting, and possibly bring together more of our "brethren of the net" than usually attend on such occasions.

The proceedings of Monday brought the actual work of the meeting pretty well to a close; few of the members, however, returned to their homes without first going upon one or more of the interesting excursions that were made to various localities in the neighbourhood. These, we feel sure, were heartily enjoyed by all who took part in them, even though some—like the writer—may not be able to avoid occasional painful reminiscences of a crawl through a lead-mine, or a night among the Sioux City mosquitoes.

The next meeting is to be held on the shores of the Atlantic at Portland, Maine, and will, we trust, prove as agreeable a reunion as the one lately brought to a close on the far away banks of the Mississippi.

ON THE GEOGRAPHICAL DISTRIBUTION OF SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, F.L.S., LONDON, ENGLAND.

The study of the geographical distribution of Insects acquires additional interest by its connection with astronomical calculations, and with geological researches. From them it is understood that the earth was once covered with snow and ice from the poles to the tropics, and that the like event may recur in the future, and restore the hemispheres

generally to the freshness and newness which they possessed at the close of the glacial period. The beginning of the cessation of this period corresponds with the origin of the present distribution of insect life, or with the commencement of the ascent of the individuals from the tropics towards the poles. This is represented on a small scale every year in the change from winter to summer, and the two periods of time agree with two aspects of the earth, the transition from the tropics towards the poles, and the upward extent of an alp, the latter being more or less an epitome of the former. It may be said by those who do not believe in the migration and settlement of insects, that the species were created in the districts which they now occupy. In this case it would appear that their creation was successive, and that they came into existence more northward and southward in proportion as the glacial climate receded. But, as each district became fitted for the maintenance of insect life, the inhabitants of the neighbouring district would be ready to occupy the vacant ground, and it is well known that the same species of insect often occurs in two or more widely separated regions. One species inhabits Europe and Chili, and may have migrated from the tropics northward and southward as the climate changed. There are indications that the tropic land was formerly much larger in extent than it is now, and would have afforded space for the multitude of insects which now inhabit the comparatively narrow temperate regions. A third explanation of the distribution of insects is the supposition of the origin of existing species by modifications of previous and now extinct organisms. No kind of insect life has been traced back to its beginning, and the blending of species which occurs in some genera locally (e.g. the Dipterous genera Laphria and Dacus), and which may be interrupted in other genera by the extinction of former connecting links, is no proof that each species did not first appear in the form which it now assumes, and the blending before mentioned represents the oneness and harmony of creation, and the unity of its Author.

The word "species" is only conventional, to express a difference, and there is no proof as to its beginning in two, in a few, or in many individuals, or that the differences were not formerly closed up by the links which are now extinct. Long periods of time have been described in the figures of short and regularly recurring divisions, and thus the occurrences therein are more readily comprehended, and in like manner the long space of earth and the long extent of time before mentioned are

understood being represented by the corresponding small part of earth and the short period of time.

The aspects from the arctic regions are more impressive than the views from the summits of mountains, and the latter renew the remembrance of the former when both have been seen in succession. Visitors of mountain-tops may have observed, in a hot, still, misty day, multitudes of insects borne to the summit from the plains below, and filling the air, which at other times is free from them, and this is like to the sudden migration of species, from the south to the north, which occurs in Europe during some seasons.

In studying the fauna of a mountain, it is most suitable to begin with the top, and to trace it downward, where the agencies or forms of life become successively more numerous and complicated in their mutual adaptations and limitations, all being as wheels which serve to regulate the great living mechanism of which they are the parts. In like manner in noticing the faunas of the two primary mountains into which the earth is divisible, their summits being the poles, and the equator their common base, it is advisable to begin with the arctic species or with those which have ascended to the highest latitudes. The differences in soil, in vegetation, and in elevation, facilitate or hinder migration and settlement of insects, and help to effect the variety of distribution, which is one of the chief attractions in the aspects of Nature.

Leucospis is a genus of Chacidice, and has several peculiarities of structure. None of the species occur in abundance, and the very few whose economy has been observed are parasites of aculeate Hymenoptera. It is well known that the very general colour of the Chalcid tribe is metallic, most often coppery or golden green, but Leucospis seems to have almost grown out of this hue, though it retains sufficient to indicate the transition between it and most of the other Chalcid families. This lustre in Leucospis appears chiefly on the face, but in some species it is spread more or less over the body. In the single species (L. affinis) which inhabits Canada, and whose geographical range extends from thence to Texas, it is wholly absent, and there is no trace of it in the species inhabiting Arabia, North Africa, and Europe. A few species occur in the United States, and the genus is more numerous in Mexico, in the West Indies, and in the Amazon region. On the eastern slope, this genus inhabits Japan, China, Hindostan, Arabia, the Mediterranean region, and more rarely the interior of France, Switzerland, and Germany.

In the latter countries, beginning with Arabia, the arrangement of its colours, more or less indicated by the species of other districts, appears to be most established, and it therein mimics some of the wasp-tribe, such as Odynerus. In the other hemisphere, it appears on the west side in Chili, and on the eastern side in South Africa and in some of the Australian Isles, and in Australia.

CIRRHOPHANUS TRIANGULIFER, *nov. gen. et. sp.*

BY AUG. R. GROTE, DEMOPOLIS, ALA.

This genus of North American *Noctuidæ* appears allied to the species we have described under the genus *Gortyna*. The habitus is arctiiform; and in outline and size it resembles *Halesidota*. The wings are long; primaries with blunted apices and rounded external margin; secondaries smaller than usual. The neuration has not been examined. The square thorax is crested centrally, and bitufted in front behind the collar. The patagia are deflected at extremities away from the body. The abdomen is stout, does not exceed the hind wings, tapers rapidly to the anus. The antennæ are stout and simple with thickened scape. The caputal scales are massed in front. The head is held forward, and the labial palpi are free and projected.

The moth is entirely of a rich soft golden yellow, with darker linear ochreous shades. The usual markings of the family are absent on the primaries, although the transverse posterior line may be faintly discerned, sinuate and geminate. The most evident markings consist of two triangulate spaces situate on the middle field of the wing. The outer and upper of these is also the larger, and they are formed by distinct dark lines meeting at right angles. The fringes are brilliant. The hind wings are paler than primaries, without perceptible markings, nor are any lines noticeable on either wing beneath. The body is concolorous with primaries above; the tegulæ, head and thoracic tufts with ochreous shadings. A specimen taken in Missouri was shown me in St. Louis by a gentleman whose name and address I have recently unfortunately forgotten and mislaid.

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The second annual general meeting of the Society was held at the Court House, Hamilton, Ontario, on Thursday evening, Sept. 27, 1872.

The President, the Rev. C. J. S. Bethune, M.A., in the chair.

The minutes of the previous meeting were read and confirmed.

The Secretary then read the Report of the Council:—

In presenting the Second Annual Report, the Council feel highly gratified at the measure of success which has attended the Society during the past year. Confined, as its membership naturally is, to a small numerical portion of the public, yet it is very evident from the increased number of new members that the Society's efforts are appreciated, and that the science of practical Entomology is being gradually forced upon the notice of our most intelligent agriculturists and horticulturists. Fifty-four new members have entered our ranks this season, several of them being entomologists of some reputation. Our total number is now 300, made up as below:—

Ontario general, . . .	70	
London Branch, . . .	51	
Kingston " . . .	15	
	136	in Ontario.
Quebec Province, . .	14	
Nova Scotia, ...	3	
British Columbia, . . .	1	
	154	in CANADA.
United States, ...	138	
England, ...	8	
Total, . . .	300	Members.

The Quebec Branch has ceased for the present to exist, but we hope shortly to see it reorganized.

Our membership in the United States is steadily increasing, and from this source we derive much substantial assistance both to our funds and our magazine. The publication of the CANADIAN ENTOMOLOGIST is still continued; the fourth volume is now nearly completed. The ENTOMOLOGIST is at present the only regularly-issued periodical on this Continent devoted to the science of Entomology. We must not omit to return our hearty thanks to those friends who have so kindly sent material to the editors, and by whose active assistance the latter have been able to keep up the good reputation of our periodical. Especially would we make honorable mention of Mr. V. T. Chambers, of Covington, Kentucky, whose admirable papers on the Micro-Lepidoptera have attracted much attention both here and in England.

Some of our members have expressed an opinion that the ENTOMOLOGIST is too exclusively scientific, and that its pages have not been made sufficiently interesting to those amongst us who are at present only beginners in the study of the science. The Council feel that there is some justice in this remark, and we would suggest to our successors, that perhaps it may be feasible to publish, in the pages of the ENTOMOLOGIST, the descriptions of our native Lepidoptera, taken from the original sources, as far as practicable, and thus give some assistance to those whose want of proper books, or inability to get even a reference to them, is an insuperable barrier to their working out for themselves the names of the various species in their collections.

The great drawback to the Society's efforts is a want of sufficient funds to procure the requisite scientific works on Entomology, many of which are very rare and costly, and also a proper supply of engravings and electrotypes of the various insects treated of. It is very difficult to meet the latter demand, owing to the want of a good artist who is well versed in the science, and able to give a correct representation of the originals; at the present time we have to send to the United States for the greater part of our wood-cuts and electrotypes.

The Council appointed a delegation to confer with the Minister of Agriculture on the subject of an increased grant, and there is every reason to hope that the result will be successful. In their application they will be strongly supported by the Fruit Growers' Association, who are making a similar appeal.

We have much pleasure in referring to the very generous donation of fifty dollars towards our library fund by the Fruit Growers' Association. It becomes indeed more manifest, as each succeeding year rolls on, that the cordial feeling existing between these two sister Societies is a strong element in their success, and furnishes fresh proof of the necessity of their continuing the work in the same able manner. We sincerely hope that this feeling will always continue.

The financial statement will, we think, be found satisfactory to the members.

The Council have thought it advisable to rent rooms at London for three years from July 1, 1872, at $80 per annum; of this the London Branch pays $30. We would here suggest and recommend that the expenses of fitting it up in a suitable manner be borne by the Society. The estimated cost is about $100. It must not be forgotten that hitherto the Society has had no proper place of keeping the stock of books, cabinets, pins, corks, etc.

The library has been largely augmented during the year, and is now the nucleus of a very fair collection of entomological books.

The property of the Society is insured for $850.

Arrangements have been made for the continuation of our Annual Reports, to be published as hitherto under the direction of the Department of Agriculture. If successful in obtaining the increased grant that we are now applying for, it is contemplated to issue with the Reports a coloured plate of insects, believing that by this means we shall be able to present to the public a much more definite and correct idea of the various insects treated of.

All of which is respectfully submitted.

EDMUND BAYNES REED,
On behalf of the Council.

Moved by Rev. R. Burnet, and duly carried, that the Report of the Council be received and adopted, and its suggestions carried out.

The Secretary-Treasurer then read his Financial Statement, which, on motion of Mr. Saunders, was received and adopted :-

RECEIPTS.

By Balance in Bank of Montreal		$233 73
" Members' Fees, including arrears		250 64
" Government grant for 1872		500 00
" Engraving, from Department for Annual Report, 1871		150 00
" CANADIAN ENTOMOLOGIST, sale of		40 98
" Pins, sale of		15 20
" Cork, "		13 87
" Library acct.—Sale of Duplicate Pamphlets	4 75	
" " Donation from Fruit Growers' Ass'n	50 00	54 75
" Expense account, Exchange, &c		22 53
" Individual accts		18 06
		$1299 76

DISBURSEMENTS.

To Expense acct., including Editor's salary for 1871	$267 01	
" Engraving for Annual Report	152 55	
" CANADIAN ENTOMOLOGIST, printing Nos. 7—12, vol. iii., and Nos. 1—8, vol. iv	428 16	
" Library acct	181 24	
" Individual accts	15 61	
" Balance in Bank of Montreal*	255 19	
	$1299 76	$1299 76

**This will be exhausted in meeting liabilities due up to December 31, 1871.*

We certify that the above is a correct statement of accounts for the year ending Sept. 19, 1872, as shown by the Treasurer's books, with vouchers for all disbursements.

CHAS. CHAPMAN, } Auditors.
J. H. GRIFFITHS, }

The following officers were then elected:—

PRESIDENT.—Rev. C. J. S. Bethune, M.A., Trinity College School, Port Hope, Ont.

VICE-PRESIDENT.—W. Saunders, Esq., London, Ont.

SEC.-TREAS.—E. B. Reed, Esq., London, Ont.

COUNCIL.—Prof. J. Macoun, Belleville; R.V. Rogers, Esq., Kingston; J. M. Denton, Esq., London; J. Pettit, Esq., Grimsby; A. Macallum, Esq., Hamilton.

AUDITORS.—J. H. Griffiths and Chas. Chapman, London.

A vote of thanks was passed to Judge Logie for his courtesy in granting the use of his room for the Annual Meeting.

We purpose giving the President's Address in our next issue.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 175.

HAGNO, *ante p. 130.*—The account of the neuration of this genus, given at page 130, *ante*, should be amended by inserting in line 13 from the top, between the word "vein" and the semicolon, the words "*besides a long branch from near the base.*"

There is an *apparent* discrepancy between the accounts of the neuration given on pp. 130 and 131, caused by the use of the nomenclature of Dr. Clemens on p. 131, while at page 130 it is described as it appears to me.

GELECHIA.

G.? quinqueannulella. N. sp.

General hue dark brown, tinged with purple in some lights. Palpi with alternate annulations of the general hue, and yellowish-ochreous, five of each, the tip being yellowish-ochreous. Vertex and face yellowish-ochreous, flecked with the general hue. Antennæ (which are almost too

short for a true *Gelechia*) of the general hue, with a narrow and indistinct annulus of yellowish-ochreous at the base of each joint, and the terminal joint also yellowish-ochreous. Thorax and primaries of the general hue, (under the lens minutely sprinkled with whitish). An indistinct pale yellowish-ochreous streak on each shoulder, a small patch of the same hue about the middle of the wings, and a costal streak of the same at the beginning of the ciliæ, and an opposite dorsal one. Ciliæ a little paler or more purplish than the general hue, with a hinder marginal line of the general hue at the base. *Alar ex.* ⅜ inch. Kentucky.

The larva is at first white, afterwards becoming pale green, with the head brown. It resides in a web on the under side of leaves of the black Oak *(Quercus tinctoria)*. Imago in July.

G.? badiomaculella. N. sp.

(Taken under the gas-light: the annulations of the palpi, if there are any, are obliterated by burning). Head shining, pale yellowish; antennæ dark brown (under the lens dusted with whitish and pale ochreous). Primaries and thorax dark brown. A short distinct ochreous-yellow oblique costal streak about the basal quarter, pointing towards a small ochreous-yellow raised tuft just within the middle of the dorsal margin: between this tuft and the costa, but nearest to the costa, is an indistinct ochreous-yellow patch; on the disc (one at the end of the disc, the other before it) are two *minute* ochreous yellow tufts. An ochreous-yellow streak at the base of the costal ciliæ, and another opposite it at the base of the dorsal ciliæ, nearly meeting in the middle of the wing. A row of minute ochreous-yellow tufts around the apex at the base. The tufts and spots are all pale ochreous yellow. *Alar ex.* ⅜ inch. Kentucky.

G. aequepulvella. N. sp.

Ochreous and fuscous, mixed in nearly equal quantities, the ochreous slightly prevailing: a small fuscous patch about the middle of the primaries, and a still smaller one about the end of the disc; last joint of the palpi fuscous externally. *Alar ex.* ⅜ of an inch. Kentucky.

G. difficilisella.

Evagora difficilisella; ante p. 66.

This species can only be included in *Gelechia* by the most indefinite extension of the genus. Nevertheless, I am satisfied that it is more properly included in a genus of the vague and indefinite limits of *Gelechia* than in *Evagora*. The terminal joint of the palpi is little more than half as long as the second, which is clavate, and both joints are clothed with loose scales. The disc of the hind wings is wide and unclosed. There

is no discal nervure, but an independent? discal branch is given off from the median? or arises at the median. The median sends off a branch before it, and is furcate behind it. The subcostal is furcate, one branch going to the costal margin and the other to the tip. In the forewing the subcostal sends two branches to the costal margin before the end of the cell, one from it, and one behind it, and becomes furcate just before the tip, one of the branches going to the tip, and one to the dorsal margin. The discal vein is short, and does not emit any branch, and the median subdivides into four approximate branches about the end of the cell. The hind wing is not wider than the forewing, and is somewhat emarginate beneath the apex.

For "anterior wings hairy" in the description, read "anterior wings hoary."

G. similiella. N. sp.

See description of *G. aeque-pulvella, ante.* This species resembles it closely, but is smaller, having an *alar ex.* of only $\frac{7}{8}$ of an inch, and being slenderer. In *aeque-pulvella*, the dusting is almost entirely ochreous, whilst in this species it is as much white as ochreous. Kentucky. At the light; in August.

G. rubensella. N. sp.

This species *might* be mistaken for *G. roseosuffusella*, Clem. It is, however, a little smaller, the brownish bands are wider, and more distinct, and the spaces between them, which in *roseosuffusella* are yellowish-white, are, in this species, overlaid with fuscous on a white ground; and the apical portion of the wings in this species is fuscous, whilst in *roseosuffusella* the apex is yellowish-white. A more decided difference, however, is in the structure of the palpi. In *roseosuffusella* the terminal joint is acuminate, and is longer than the second. In this species it is scarcely so long as the second, and much less acuminate. *G. roseosuffusella* is a very variable species, but I am fully satisfied that this is a distinct species, and it perhaps resembles *G. rubidella*, Clem., as closely as it does *roseosuffusella.*

The palpi are whitish, with two large brownish spots on the under surface of the second joint; and with two annulations and the tip of the third joint of the same hue. Tongue brownish. Head yellowish-white, very faintly tinged with roseate. Antennæ brown, annulate with white. Thorax pale ochreous, with brown spots on the anterior margin and sides. Wings yellowish-white or pale ochreous, overlaid with fuscous and reddish-brown, so as to obscure the ground-colour, and entirely conceal-

ing it in the apical portion; dorsal margin pale ochreous, faintly tinged with roseate towards the base, deeply so towards the ciliæ, and with one or two distinct bright roseate spots at the base of the ciliæ. Near the base is a narrow oblique brown costal streak or band extending to the fold. About the middle, another wider one, the middle portion of which is rather reddish-ochreous than brown, and is tinged with roseate; beyond the middle is another, which extends to one of the roseate patches at the base of the dorsal ciliæ. Each of the costal brown streaks is margined both before and behind with white, which is distinct on the costa, but is only distinct in some lights on the disc. In some lights the entire wing appears to be dusted with roseate, and with small reddish-brown spots. Ciliæ pale fuscous? (crisped by the gas-light so that I can not be certain). *Alar ex.* ⅓ of an inch. A single specimen taken at light in Kentucky in August.

G. disco-ocellella, N. sp.

Dark brown, tinged with roseate or purplish; second joint of the palpi dark brown, ochreous-yellow along the inner surface; third joint ochreous yellow except the base, which is dark brown. Head ochreous-brown; antennæ brown. Thorax ochreous, with a narrow rather indistinct median brown streak. Primaries brown, tinged with roseate or purple, and faintly streaked with ochreous within the inner margin, *and with a yellowish-white spot containing a black central dot* at the end of the disc, a small black spot on the fold, and one about the middle of the wing, and with a few ochreous-yellow small spots around the apex between the nervules. *Alar ex.* ⅝ of an inch. Kentucky. Taken at the lamp in September.

AGNIPPE, *gen. nov.*

Head and face smooth, face retreating; palpi recurved, reaching beyond the base of the antennæ, the second joint somewhat enlarged towards its apex, the third pointed, and more than half as long as the second; maxillary palpi minute; tongue rather short, scaled; antennæ about half as long as the wings, simple, placed in front of the eyes, which are small and scarcely visible from in front or above.

Anterior wings with a tuft of raised scales within the dorsal margin before the middle, lanceolate-ovate, pointed; the costal attains the margin just behind the middle; discal cell long, rather narrow, closed by the gradual rounding of the subcostal and median into the short discal vein; the subcostal sends three veins from near the end of the cell, two of which attain the margin before the apex, whilst the third or apical branch attains

the apex after sending two short branches to the margin before it; the discal sends two approximate veins to the dorsal margin behind the apex; the median attains the dorsal margin, to which it also emits a single branch before the end of the cell; the submedian is furcate near the base. (All the veins are united near the end of the cell).

Posterior wing trapezoidal, a little wider than the anterior, emarginate beneath the apex, and with the costal margin excised from the middle to the tip; the costal vein attains the margin about the middle; the discal cell is unclosed; the subcostal vein is nearly straight, and attains the margin just before the apex; the median is deeply concave in the middle, sweeping up to the dorsal margin behind the apex, sending one branch from about its middle, and two other shorter ones from near its end.

Allied by the palpi to *Gelechia*, and by the neuration to *Anorthosia*, Clem., and *Chrysocheryx*, Clem. I do not knowthat Ishould have separated it from *Gelechia* but for the more pointed and convoluted wings, the acute apex of which is presented to the observer as the insect reposes standing upon its face with the abdomen projecting.

A. bicoloretla. N. sp.

Tongue and head yellowish-white; palpi and undersurface brownish, mottled with yellowish-ochreous. Vertex slightly dusted with brown; thorax and base of the anterior wings yellowish-ochreous, with a bluish-brown patch on the anterior margin of the thorax. Anterior wings, from beyond the base, brown with a bluish cast, from the middle to the apex thickly intermingled with yellowish-ochreous and some white. (The brown is of an indescribable tint, tinged with bluish or purple, according to the light). Antennae yellowish-ochreous, annulate with brown. *Alar ex.* ½ inch. Kentucky in April.

A. fuscopulvella. N. sp.

Palpi pale yellowish, terminal joint fuscous at the base and near the tip. Head white. Antennae yellowish-ochreous, annulate with fuscous; thorax and anterior wings whitish, tinged with yellowish-ochreous, densely dusted with fuscous; abdomen dark brown, each segment fringed with whitish. *Alar ex.* ⅝ inch. Kentucky, in April.

An interesting paper by Mr. William Couper, of Montreal, with an account of his recent collecting tour in Labrador, was received too late for publication in the present number, but will appear in our next.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 170.)

[207.] FAMILY CLYTHRIDÆ.

276. CHLAMYS PLICATA *Olivier.*—Length of body 2 lines. Taken in Canada by Dr. Bigsby; also in Massachusetts.

Body obscure, bronzed. Head impressed posteriorly between the eyes; rhinarium, antennæ, and an elevated space adjoining the eyes anteriorly, rufous; nose indistinctly punctured: prothorax very finely and concentrically scored, with some scattered indistinct punctures; posteriorly considerably elevated: elevation bifid; behind this elevation the prothorax is producted and emarginate: scutellum obtriangular: elytra tuberculated with several acute, compressed tubercles, the anterior ones carinated; interstices with some scattered deep punctures: space between the four posterior legs punctured with large shallow punctures.

[208.] FAMILY CRYPTOCEPHALIDÆ.

277. CRYPTOCEPHALUS PUBESCENS *Fabr.*—Length of body 2¼ lines. Taken in Canada by Dr. Bigsby.

Body black, with a *very* slight brassy tint, a little glossy, grossly and thickly punctured; downy more or less with cinerascent down: prothorax with a longitudinal levigated line, posteriorly with a double sinus: scutellum elevated towards the apex, perfectly smooth: elytra with a lateral lobe towards the base, shoulders with a tubercle. [Belongs to Sufirian's genus *Pachybrachis.*]

278. CRYPTOCEPHALUS NOTATUS *Fabr.*—Length of body 2¾ lines. Taken in Canada by Dr. Bigsby.

Body black, naked, glossy. Nose with a bilobed reddish-yellow spot at the apex; front with a yellow curvilinear spot adjoining the eyes on their inner side; between the eyes behind is a pair of round impressions, and a longitudinal intermediate abbreviated channel; antennæ mutilated in the specimen, but what remains of them is reddish-yellow: prothorax levigated, but sprinkled with very minute and slight punctures, visible only under a powerful magnifier; behind with a slight sinus on each side: scutellum levigated and elevated posteriorly: elytra deeply punctured with the punctures arranged in rows, the sixth row from the suture is

interrupted, and in the interstices on each side of it are some irregular punctures, the intermediate rows do not reach the apex; a luteous band, abbreviated next the suture and growing gradually wider till it reaches the lateral margin, and an irregular spot at the apex of the same colour, distinguish the elytra.

Fabricius describes his *C. notatus* in so few words that it admits of some doubt whether his insect is synonymous with Dr. Bigsby's here characterized. The spots at the apex can scarcely be denominated *puncta*, but as he occasionally designates a large spot by this term, and both insects are from North America, for the present it may be allowed to stand under the above name. [Haldeman states that "*C. notatus* Fab. is southern. The northern species, described by Kirby under the same name, has been called *C. sellatus* by Suffrian." Common in Toronto and other parts of Ontario.]

[209.] 279. EUMOLPUS (ADOXUS) VITIS *Fabr.*—Length of body 2¾ lines. Several taken in the journey from New York, in lat. 54° and 65°.

[210.] Body black, a little glossy, hairy with cinerascent hairs, minutely punctured. Palpi rufous, last joint black; five first joints of the antennae rufous, the rest black; elytra and tibiae rufous.

Both Geoffroy and Fabricius complain of the ravages committed by this little species upon the vine in Europe, and probably it is equally destructive to those of America. [A very destructive insect in Europe, but of doubtful occurrence in America.]

FAMILY CHRYSOMELIDÆ.

280. CHRYSOMELA PHILADELPHIA *Linn.*—Length of body 3½—4—4¾ lines. The type and variety C taken in Canada by Dr. Bigsby. Variety B in Nova Scotia by Dr. MacCulloch.

Body oblong, black-green, naked, glossy, convex, punctured with scattered punctures. Palpi, antennae, rhinarium, and legs rufous; labrum hairy: prothorax with the punctures at the sides more numerous than those on the disk: elytra pallid, with a longitudinal stripe at the suture with three diverging obsolete branches, and several irregular spots; one at the shoulders larger than the rest and as it were broken, or obtus-angular, all of a dark green: the elytra are grossly punctured with scattered punctures, but next the suture the punctures are disposed in two rows, the sutural one [211] extending from the base to near the apex, where it becomes confluent with the second, both diverging towards the base and surrounding the upper branch of the sutural stripe; there is a

fourth series of punctures at a little distance from the lateral margin, and the interstice between them is impunctured; epipleura dark-green.

N.B. The two lower branches of the above stripe are surrounded by a common series of punctures.

VARIETY B. Smaller, green-bronzed, green spots of the elytra more numerous, epipleura pallid.

C. Sutural stripe with only one branch, the two lower ones forming separate spots; epipleura pallid.

This varying species may be known from the succeding ones by the green colour of its body; all the varieties are distinguished by the obtus-angular spot at the shoulders of the elytra: the varying number of green spots on these organs is produced by the separation of some of the irregular ones into distinct ones, and the lower branches of the sutural stripe doing the same. Variety C comes nearest to that figured by De-Geer and Olivier. [Quite common in Canada].

MISCELLANEOUS.

AN ERROR CORRECTED.—On page 258 of his Guide to the Study of Insects, Dr. A. S. Packard describes and figures what purports to be the larva of *Melitaea Harrisii*. His description, "made from an alcoholic specimen in the collection of Mr. Sanborn," is as follows:—

"It (the larva) is cylindrical with six acute, small tubercles in each side of each thoracic ring, while on the abdominal rings the four dorsal tubercles are large and remarkably boot-shaped, the toe being formed by a lateral prolongation of the tubercle, and the heel is also well formed, from which arises a short bristle. The specimen is dark, with a lighter stripe along the back on each side of the median line of the body. Its length is .80 of an inch."

About the middle of last May, a larva, agreeing with the above description, was handed me. It was found in or upon decaying wood, and, in confinement, fed upon that and also upon wild Aster. I supplied it with the latter, because Dr. Packard states that "it feeds on *Diplopappus umbellatus*." With me it fed freely upon *Aster dumosus*. June 14, the supposed *Melitaea* spun a slight cocoon, and, on the 29th of the same month, emerged. The imago proved to be an *Aglossa*, and is, I think, *Aglossa debilis*. It is difficult to conceive how the same characteristics, characteristics too, so striking and unusual, can distinguish the larvæ of

genera so widely separated; and it would appear that Dr. Packard, usually so correct in his statements, has, in this instance, allowed himself to fall into error.

I am indebted to Mr. T. L. Mead, of New York, for determining the identity of this larva with that described in Packard's Guide.—G. M. DODGE, Ohio, Ill.

TENT CATERPILLARS.—Apropos of the scarcity of the Tent Caterpillars this season: About ten days ago, an acquaintance informed me that the fences and sidewalks near the residence of Horace Yeomans, Esq., on Bridge Street, West Belleville, were covered by an immense swarm of Caterpillars. As I could not well go thither at that time, I sent one of my boys, who soon brought me about twenty specimens of the Forest Tent Caterpillar *(Clisiocampa Sylvatica.)*

At my earliest convenience, some three days after, I visited the spot, and found some of them still clinging to the fence. At the same time, I saw a remarkable example of their destructive powers. Near the N. E. corner of Mr. Yeoman's grounds stands a remarkably well-grown, full-branched Oak tree, about two feet diameter at four feet from the ground, and rising to a height of some sixty feet; while its branches, extending full fifteen feet from the main stem, overspread a space of over seventy square yards. In the spring and early summer, it as usual presented to the eye a dense mass of luxuriant foliage—to-day it does not boast a single leaf; they are all eaten off to the midribs, which still adhere to the footstalks, and give the tree a most extraordinary appearance. It is evident that the migration of these caterpillars was occasioned by the exhaustion of their commissariat, which obliged them to seek "fresh fields and pastures new." There must have been several broods to effect such an enormous defoliation, and indeed I found specimens of all sizes, from two inches down to half an inch in length. Another Oak outside of Mr. Yeoman's fence, near the S. E. corner of his lawn, is apparently undergoing the same process of denudation. I shall watch with interest the effect of these insect depredations on the health of the trees next season, and report the same for the ENTOMOLOGIST.—PROF. BELL, Belleville, Ont., Aug. 19.

DANAIS ARCHIPPUS.—I have often seen these tawny butterflies disporting themselves over the waters of the Kingston Bay some hundreds of yards from shore; still I was quite surprised to see, early in August, two specimens flying boldly some seven and eight miles out from the

Scarborough coast, as if they had fully determined to cross Lake Ontario and visit their American relatives. One poor fellow, however, had come to grief, and floated with outstretched wings upon the rippling wavelets. The time was about eight in the morning, and there was no wind to blow them out to sea.—R. V. ROGERS, Kingston, Ont.

DORYPHORA 10-LINEATA, the champion potato-eater, has made his way east as far as this city. I saw several crawling about in September. —R. V. ROGERS, Kingston, Ont.

DIAPHEROMERA FEMORATA, *Say*, OR SPECTRUM FEMORATUM, *Harris*. Are the "walking sticks" unusually plentiful this year? I counted, and could easily have captured, twenty-eight of them within a couple of hours in a wood near the village of Vittoria, Co. of Norfolk. They were all upon the trunks of oaks; not one was to be seen on any other kind of tree, although beech and maple were growing in close proximity to the oak. On one tree I saw seven, and was delighted thereat, as in the eastern section of Ontario, though to be found, they are yet far from common. It was at the end of August, and the process of copulation was still going on, yet I caught two little creatures of a light green colour, and the third of an inch long, which I took to be young "sticks." Packard says that in this genus "the antennæ are rather short;" my experience is that in this species they are over two inches long. Both Harris and Packard accuse the Spectre of being very sluggish and inactive; I found that on the slightest touch—even when in the act of coupling—the insect made off, marching up the trees on their tall stilt-like legs in a manner perfectiy surprising, till quickly they were far beyond the reach of pursuit.—R. V. ROGERS, Kingston, Ont.

PERSONAL.

DR. A. S. PACKARD, JR., has just returned from a four months' visit to the entomological collections of Europe, where he compared many of our foreign-named species of Lepidoptera to the types.

DR. JOHN L. LECONTE is expected home from his long stay in Europe this month of October, and will then commence the classification of the North American *Curculionidæ*, an event that all entomologists will rejoice in.

DR. GEO. H. HORN is preparing a synopsis of the genus *Lebia* of the family *Carabidæ*.

The Canadian Entomologist.

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REMARKS ON LEPIDOPTERA COLLECTED AT FOX BAY, ANTICOSTI, AND THE NORTH SHORE OF THE ST. LAWRENCE, BETWEEN JUNE 18TH AND AUGUST 1ST.

BY WILLIAM COUPER, MONTREAL.

When I decided on an Entomological tour during the past summer to the Island of Anticosti and the coast of Labrador, I fully expected to bring home sufficient material, not only to satisfy the few subcribers to the enterprise, but (after supplying them) enough to remunerate myself for the risk of the voyage and loss of time. Your readers are already acquainted with my misfortune; still, I hope that the lost species will be replaced, as it is my intention to go over the ground again (if God spares me) next summer. Entomologically speaking, the region is totally new. A great deal of knowledge can yet be obtained from another research in these regions, as the following brief remarks sufficiently show. For years past I wished for an opportunity to explore the Island of Anticosti, in order to collect its insect *fauna* and obtain a knowledge of the species occurring thereon. Before I visited it, I had an idea that it would be found deficient in many of the Coleopterous forms which exist on the shores of the St. Lawrence, to the north and south of it. So far, therefore, my surmises are correct, as I found it meagre, indeed, in Geodephaga. No Cicindelidae occurred in my rambles, and but two or three species of Carabidae were met with during the time I remained there. The species obtained belonging to the latter were evidently brought there by commerce. The island is evidently rich in Lepidoptera and Hymenoptera, and probably Longicornia and Curculionidae. No doubt its fresh water ponds, when carefully examined, will be found to contain nondescript species of aquatic Coleoptera. The few species belonging to the latter order and Hymenoptera, collected on the Island, also those occasionally picked up on the Labrador coast, will, in due time, be described in the CAN. ENT.

There is nearly one hundred miles between the West point of Anticosti to Fox Bay, near the East, and where I collected. Heretofore,

it was almost inacessible to the Naturalist, who could only visit it to undergo much privation and hardship. Its forest is dense, and in many places almost impenetrable, but a great portion of the flora resembles that found in the mountain region north of the city of Quebec, and I have no doubt that the bulk of the Lepidoptera to be met with on the West Point will be found similar to those occurring in high northern latitudes. Mr. Strecker says that "the moths, with a few exceptions, are the same as some I took in the mountains of Luzerne Co., Penn. In fact, when I opened your box, I was struck with the similarity of its contents to a box I brought home from that trip—thirteen species of moths like thirteen species out of the twenty-two you sent me. Is not this curious? But, after all, if we consider that Luzerne County is the most mountainous part of this State, almost impenetrable and wild, and fire feels comfortable there in June, it is not such great matter for wonder."

PAPILIO POLYXENES *Fabr., var.* BREVICAUDA, *Saunders.*—I took four specimens of this species on the Island. It appears to be rare at Fox Bay. The specimen sent to Mr. H. K. Morrison, Boston, corresponds with the description of *brevicauda.* Regarding the ♂ and ♀ which I sent as *P. asterias* to Mr. Herman Strecker, of Reading, Pa., he writes that the ♀ of *asterias* has not got the yellow macular band on the wings as the ♂ has, or, at least, it is only represented by a few small spots, whereas the ♀ from Anticosti has the yellow band of unusual size, even broader than on the ♂ which accompanied the latter, and that the Anticosti ♂ has the band twice as broad as any specimen seen by him from the United States, Canada, or Central America. He adds, that it comes as near to the South American *P. Sadulus* as it does to *asterias.* I am, therefore, inclined to believe that there are two Northern black and yellow varieties of *Papilio*, viz.:—one of *asterias*, occurring along the north shore and coast of Labrador to Newfoundland, while *P. polyxenes* Fabr., var. *brevicauda*, is so far confined to the Island of Anticosti.

PIERIS FRIGIDA *Scudder.*—This species was quite common in Labrador during my visit in 1867, and I met with it on the 20th of last June, at Fox Bay, Anticosti, where it was not abundant. In October of the above year, a ♀ *frigida* was forwarded to Mr. Scudder, who thought it was the above species, but as I did not send the ♂, he was not positive. It would be well, therefore, to compare it with congeneric species.

COLIAS INTERIOR, *Scudder.*—This butterfly occurs on the north coast of Labrador, from Sawbill River to Natashquan. It is not frequently seen

near the sea; but generally met with in the woodland and mountain regions in the interior. The specimens collected were destroyed, and the only one brought home was sent to Mr. Strecker, who writes as follows:—"I have strong doubt about the genuineness of this species. I compared the female you sent me with five females of *Pelidne* (from above Rupert's House, B. A., and Labrador), and the only difference I can detect is the color of the upper surface of the wings. The one you sent me is yellow, while my examples of *Pelidne* are white, which is no distinction at all in the *Coliades*, as most of them are blessed with two kinds of females, one the color of the *male, and the other albino."

ARGYNNIS CHARICLEA *Esp.*—One of the earliest and most common butterflies in Labrador. In my opinion, distinct from *Boisduvalii*, which appears at least a month later in the north. I took fresh specimens of the latter at Mingan, six years ago, on the 22nd of July, when *charicles* had terminated its season. Mr. Morrison pronounces the above as a variety of *Boisduvalii*, stating that he possesses specimens from the Alps.

ARGYNNIS ATLANTIS *Edws.*—When on my way home, about the end of July, I took a specimen of the above at Sawbill River. It agrees in every particular with specimens taken by my friend, Mr. Strecker, in Luzerne County, Pa. He states that the Pennsylvania specimens are darker and more reddish than those in his collection from Lake Superior.

PHYCORIDES THAROS *Cram.*—I took a few specimens of this butterfly at Sawbill River, Labrador, which I regarded as a *Melitaea*, but, being in doubt regarding the species, I sent an equal share to those who were entitled to them. Mr. Morrison named it as above, stating that it occurs from Labrador to Texas, and the Atlantic to the Rocky Mountains. The

* I have noticed this curious connection with *Pieris Rapæ*, which have extremely yellow males, occurring here in the fall. On my return from the North, I captured near this city, last September, a yellow male in *coitu* with a white female. I sent the former to Mr. Morrison, of Boston, who states that it is "the var. *Novanglia* Scudd., and that it is not uncommon in the spring around Boston." I am of opinion that white and sulphur yellow varieties of *rapæ* may be found constantly wherever they occur. The food plants of *rapæ* are cabbage, mignonette, nasturtium, and various cruciferæ, therefore it may be that the American specimens exhibited by Mr. Scudder in Europe, were what the late Mr. Walsh termed *phytophagic*. There is no doubt, in my mind, that the food of caterpillars produces the varieties which lead to so much confusion in the determination of butterflies. My friend, Mr. F. B. Caulfield, of this city, informs me that he has reared caterpillars of *rapæ*, found on mignonette, which produced imagoes of a deep sulphur yellow.

specimens sent to Mr. Strecker were identified by him as *Melitea Batesii, Reakirt*, described in Pro. Ent. Soc. of Phil., 1865.

VANESSA (GRAPTA) PROGNE *Cram.*—A single specimen taken at Fox Bay, Anticosti, on the 20th June. Similar to the same species taken at Quebec.

VANESSA ANTIOPA *Linn.*—One specimen captured at Fox Bay, Anticosti, on the 19th July.

PYRAMEIS CARDUI *Linn.*—This species occurs early on Anticosti. On my arrival at Fox Bay, they were worn and unfit for collection.

PYRAMEIS ATALANTA.—Fox Bay, rare in June.

CHIONOBAS—?—At Thunder River, Labrador, in July, I took one specimen of a species belonging to the above genus, which I sent to my esteemed friend, Mr. Strecker, who writes as follows:—"I have compared it with *Ch. Semidea, Crambis, jutta, Balder, also, Uhlerii, Taygete (Bootes)*, the only ones in my collection that could possibly have any affinity with it, but am afraid to pronounce it the same as any one of them. It is nearer to *jutta* than to any other, but I won't say it is it. After it is expanded, I will give it another examination." Probably this is another instance in which we see the external change produced on the imago through the food plant of the caterpillar, and I have no doubt but it will turn out to be a variety of *jutta*.

LYCÆNA—? *(N. S.)*—I collected a few specimens of this species at Musquaro, Labrador, in July, 1867, a specimen of which was sent to Mr. Scudder, of Boston, in September following. Mr. S. wrote to me that it was, to the best of his knowledge, *L. Lygdamus* Doubl., but he wished me to inform him whether the Labradorian specimens "were all marked with a single spot on the secondaries, where his Hudson Bay specimens have two." Not having a sufficient number to examine, the identification could not be determined at that time, but on my arrival at Fox Bay, Anticosti, it was the first butterfly that attracted my attention, and I was fortunate in obtaining twelve dozen of them. On lately referring to Mr. Scudder's letter of Oct. 1st, 1867, the remarkable difference pointed out by him was discernible in all my specimens, but, not knowing the species, I sent them to my subscribers as *L. Lygdamus*. Mr. Morrison writes as follows:—"*Lycæna ? (N. S.)*—You named this species *L. Lygdamus* Doubl. I have compared your specimens very carefully with my specimens of the true *Lygdamus* from Northern New York, and am satisfied that it is a distinct species. The color of the whole underside is different; also, the

arrangement of the spots on the underside of secondaries slightly, but constantly. The black ocelli to the spots, very conspicuous in the true *Lygdamus*, are almost wanting in your species." Mr. Strecker has also suspicion regarding it. However, I have no doubt but that this *Lycæna* will turn out to be one of a few new species yet to be discovered on the dividing line between the Canadian and Arctic Lepidopterous faunas.

LYCÆNA—? *(N. S.)*—I sent one specimen of a species of this genus to Mr. Morrison, who informs me that it is "closely allied to *epixanthe*,' but I think different. Congeneric with the *castro* of California and the *xanthe* of Europe. It is nearer *castro* than *epixanthe*." This butterfly was taken at Sawbill River, Labrador, on 20th of July, and, after all my mistortune, I was pleased that day. I trust that my talented friend, Mr. M., will shortly describe it in the CAN. ENT.

LYCÆNA LUCIA *Kirby*.—Common in the woods at Fox Bay during the month of June. It also occurs abundantly on the south-western coast of Labrador. Mr. Morrison appears to notice no difference between the Anticosti specimens and those taken in Western Canada, and the middle and the Eastern United States, but Mr. Strecker says that they are darker underneath than the United States specimens generally are.

LYCÆNA SCUDDERI.—This is one of the most permanently marked species in North America. The Entomologist may occasionally obtain an obscure specimen, but upon thorough examination, it will be found prototypic of its congeners of the valley. The specimens forwarded to my correspondents differ in no particular from United States and Canadian examples.

HESPERIA PANISCUS *Fabr*.—A single specimen captured at Fox Bay, Anticosti, on the 26th June. It was sent to Mr. Morrison, who informs me that it does not differ in the slightest from the European specimens of *paniscus*. It is close to *Mandan* Edw. I feel convinced that the latitude of Quebec is the most northern limit of the *Hesperidans*. *Alypia Langtonii* Couper. I was astonished when I met this beautiful moth in Fox Bay, Anticosti. Mr. Strecker states that "he found it in the mountains of Luzerne, Pa." It is curious that since I described this insect, some years ago, it appears now in Western Canada and in high latitudes many miles south of Quebec. *A. octomaculata* was also taken at Fox Bay.

SESIA RUFICAUDIS *Kirby*.—Fox Bay, Anticosti; uncommon. This species is very common at Quebec.

DEILEPHILA GALLII *Bott*. (*Gallii* Schiff.)—Fox Bay, Anticosti, and Sheldrake River, Labrador; uncommon, but abundant at Quebec. Mr.

Strecker writes as follows:—"In spite of all American Lepidopterists in a bunch, this is the *D. Chæmanerii* Harris, but it is identical with the *Gallii* of Europe. I have compared specimens from New York, Pensylvania, Massachusetts, Canada, Ohio, France, Regensburg, the Hartz and various other parts of Europe, and neither I now, nor any other living human being can detect any difference."

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 105.

ADRASTEIA.

A. quercifoliella.

Depressaria bicostomaculella, ante p. 127.

The former description of this species was made from a single old specimen, on which no tufts were visible (having, no doubt, been removed in setting the specimen, which was, however, otherwise undenuded.) Since the publication of that description, I have bred the species, and the tufts in the fresh specimen are distinct, and the insect unquestionably belongs to this genus. The following description of the fresh specimen is more accurate than the preceding one. I have changed the specific name, giving it that of the food-plant.

Head and its appendages, thorax, and primaries, with a somewhat indistinct dark purplish lustre, especially on the darker portions. Second joint of the palpi blackish, with white and a few ochreous scales intermixed; the third joint blackish, with but few white or ochreous scales, with the extreme tip pale ochreous. Head whitish; face with few blackish scales intermixed; vertex densely dusted with blackish. Antennæ dark fuscous, with a faint narrow pale ochreous annulus at the base of each joint. Thorax and primaries—to the naked eye, dark iron gray with blackish irregular spots, some of them large—under the lens, blackish freely dusted with pale blue, white, and some pale ochreous scales, with large velvetty blackish spots not dusted. Ciliæ yellowish white, the basal half of the dorsal ciliæ freely dusted with blackish. The thoracic tuft is pale yellowish, those on the wings are small and whitish; the largest is nearest the base and within the dorsal margin; the other two are just behind the middle, one before the other, and both nearer to the costal

than to the dorsal margin; there is a small whitish streak at the beginning of the dorsal ciliæ, and an opposite costal one, and another faintly indicated costal one near the base. *Alar ex.* $\frac{7}{8}$ inch.

The larva feeds on the under side of leaves of the black oak, in a web. It is pale yellowish, with the head and first three segments dark brown, the first segment shining brown.

A. querciella. N. sp.

Depressaria querciella, ante p. 127.

As before mentioned, this species has the thoracic tuft; and though I cannot detect any raised tufts upon the wings, yet, as in other parts of its structure, it is identical with the above described species, as well as in the ornamentation, it belongs more properly in this genus than in *Depressaria*. The statement at p. 127, that "*it is a Depressaria* in all respects, except the tuft," is too broad. It would be more correct to say that it closely approaches *Depressaria* in all respects, &c. The brush on the palpi is scarcely long enough for *Depressaria*, the primaries are too narrow and the style of ornamentation is different. In the fresh specimens also, the abdomen is somewhat convex, as in the other insects which I have placed in this genus. In all of these insects the brush is spreading, and sometimes appears to be distinctly divided.

This species and *A. quercifoliella* were bred from Oak leaves, and the two other species were taken in Oak woods, and probably feed either upon Oak or Hickory leaves.

VENILIA, *gen. nov.*

The insect which I make the type of this genus is related to *Anarsia*, *Cleodora*, and *Ypsolophus*, perhaps more nearly to the first named than to either of the others. The tuft at the end of the second joint of the palpi resembles that of *Anarsia*, and the neuration is nearer to that of *Anarsia* than to that of *Ypsolophus*. I am not acquainted with the neuration of *Cleodora*. It resembles the latter genus in the slender antennæ; but the wings are wider and the terminal joint of the palpi too long and slender.

Terminal joint of the labial palpi as long as the second, slender, almost acicular. Tuft at the end of the second joint scarcely concealing the base of the third joint, and pointing downward rather than forward. Antennæ very slender, indistinctly pectinated, and microscopically pubescent, scarcely reaching the apical third of the wings.

Wings rather wide. Primaries ovate, lanceolate, faintly falcate beneath the tip. The costal attains the margin; the subcostal sends from before

the middle a long branch to the costal margin, and two other approximate branches from the end of the cell, from the first of which it bends down to its union with the discal vein, whence it proceeds towards the apex, before which it divides, sending one branch to the costal and one to the dorsal margin near the apex. Discal cell wide at the end, closed, the discal vein emitting two branches to the dorsal margin; the median emits two branches before the end of the cell, from which it curves to the dorsal margin. Submedian furcate at the base. Hind wings with the costal margin, nearly straight, a little arched towards the base; costal vein straight, long, attaining the margin before the apex; subcostal very faint from the base to the discal vein, distinct from thence to the apex, straight; cell closed by a distinct discal vein which sends two branches to the dorsal margin; median oblique, nearly straight, furcate at the end of the cell, and with a branch to the dorsal margin before the end of the cell. Hind margin regularly curved, not emarginate; narrower than the fore wings.

V. albapalpella. N. sp.

Apical joint of the palpi snowy white, with a narrow brown ring at the base; second joint white at its apex and on the inner surface; grayish-brown on the outer surface. Antennae grayish-brown, annulate with white. Head, thorax and primaries grayish-brown, with a row of yellowish-ochreous spots around the apex of the wings at the base of the ciliae. *Alar ex.* $\frac{5}{16}$ of an inch. Captured in June in Kentucky.

ANARSIA.

A.? *pruniella*, Clem. *Proc. Acad. Nat. Sci., Phila, 1860, p. 169.*

In Mr. Stainton's valuable collection of Dr. Clemens' papers (for which Mr. S. is entitled to the lasting gratitude of every student of the American *Tineina*), page 36, Dr. Clemens uses this language: "Yesterday I found the ♂ of *Anarsia? pruniella. It is the same as the European*, and the genus is no longer doubtful." The italics are mine. Same as the European what? I suppose Dr. C. means the European *A. lineatella* Zeller. My specimens were taken on Plum trees, and I recognize them easily in Dr. Clemens' description of his specimens, which were bred from the Plum. But I have received from Mr. Townend Glover a specimen which he bred from Peach leaves, and which is identical with mine. And Mr. C. V. Riley informs me that specimens which he bred from Peach leaves, and sent to Prof. Zeller, were recognized by Zeller as his species. There can be no reasonable doubt that the species is the same as Zeller's, and that his name has priority.

BEGOE, *gen. nov.*

The insect described below as the type of this genus I have been unable to place in any genus known to me. I do not deem it necessary to give any further diagnosis of the genus than to say that it is an *Ypsolophus*, except as to the antennæ and palpi. The former are minutely pectinated, and are otherwise like those of *Ypsolophus*. The terminal joint of the palpi is, perhaps, a little more robust than in *Ypsolophus*; the second joint is clavate, rounded at the apex, laterally compressed, vertically thickest just before the end, forming a thick, rather compact, undivided brush. As to the length of the palpi and the relative lengths of the joints, it agrees with *Ypsolophus*.

B. costolutella. N. sp.

Tongue and face brownish-ochreous; palpi ochreous yellow; head brown on top, ochreous yellow above the eyes; thorax dark shining brown, except the anterior margin and patagiæ, which are ochreous yellow. A line drawn from the base of the anterior wings, near the dorsal margin, to the beginning of the costal ciliæ, will divide the wing into a narrower anterior (or costal) ochreous yellow portion, and a wider posterior (or dorsal) portion, which is shining dark brown. The anterior or ochreous yellow portion, however, becomes furcate about the apical third of the wing, sending a curved branch into the dark brown portion; this branch is at first wide, but curved, gradually narrowing towards the dorsal ciliæ, which it does not quite reach. There is a faint, narrow, ochreous yellow hinder marginal line at the base of the ciliæ, which are paler than the dark portion of the wing, their basal half being darker than the apical half. Posterior wings and their ciliæ grayish slate color. *Alar ex.* ½ in. Kentucky.

If one could believe that the projecting brushes had been removed so evenly and smoothly as in this insect, without otherwise injuring them, and leaving no trace that they had ever been other than they now are, then this insect would be an *Ypsolophus*, resembling *Y. cupatoriella (vid. post-prox.)*.

NOTES ON SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, F. L. S., LONDON, ENGLAND.

The geographical distribution of *Smicra* differs much from that of *Leucospis*. Unlike the latter genus, which is spread thinly and somewhat

equally over the warm and temperate regions of the earth, *Smicra*, with very few exceptions, is limited to the New World, where there are some species in North America, many in Mexico and in the West Indies, and great abundance in the tropical parts of South America, and the genus has thus much more influence than *Leucospis* in regulating, by means of transfer, the increase of other insect tribes. Its body is ornamented with very various patterns of black on a yellow or red ground hue, except a few species, which are mostly or entirely black. The family *Chalcididæ*, to which it belongs, is even more free than the *Leucospidæ* from metallic lustre, the only exception being the isolated genus, *Notaspis*, a native of St. Vincent's Isle, in the West Indies. The very few species in Asia and Africa hardly possess the typical form, but the three or four European species are as characteristic of the genus as those of America. The American species from Georgia, which I have mentioned as a variety of the European *S. nigrifex*, may be considered as a distinct species. It was not known to Cresson, who has described many new species of the genus, but will probably be soon distinguished and named in America. It is a little smaller than *S. nigrifex;* the forewings are a little narrower; the petiole is a little longer; the hind coxæ are a little shorter: the hind femora are not black at the tips, and have beneath smaller and more numerous teeth; the tibiæ are piceous, red at the base, not wholly black, as are those of *S. nigrifex*. The only Canadian species is *S. Canadensis*.

ANNUAL ADDRESS

OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, 1872.

To the Members of the Entomological Society of Ontario:

GENTLEMEN,—It is my happy privilege once again to congratulate you upon the completion of another year of progress in the annals of our Society. As you have already learnt from the very satisfactory Report of our excellent Secretary-Treasurer, the list of members of the Society has been largely added to during the past twelve months; the Library has been increased by the purchase of a number of valuable Entomological works; a cabinet and microscope have been bequeathed to us by our late lamented member, the Rev. Professor Hubbert, and our collections have been much improved; a comfortable and commodious suite of rooms has been procured in a central locality in London, Ont.,—the present head-

quarters of the Society; the CANADIAN ENTOMOLOGIST has been regularly issued with, we trust, no diminution in the value and interesting character of its contents; our Second Annual Report on Noxious and Beneficial Insects, prepared by Messrs. Saunders and Reed, and myself, and containing notices of the insects affecting the Apple, Grape, Plum, Currant and Gooseberry, Wheat crops, Potato, Cabbage, Cucumber, Melon, Pumpkin and Squash, has been duly published by the Legislature of Ontario, and no doubt has long since been in the hands of you all. Such, gentlemen, is our record for the year that is now brought to a close, and, having in addition, a satisfactory balance-sheet from the Treasurer, we feel that mutual congratulations are not out of place, and that we who have been honoured with official positions in the Society, can look back upon our efforts in its behalf with at least the agreeable feeling that they have not been altogether in vain.

If we turn, moreover, from our own especial interests to the condition and prospects of American Entomology in general, we find much to afford us satisfaction and encouragement. No large work, indeed, on any particular order of insects has appeared during the past year, but many valuable reports of State Entomologists and portions of serial publications have been issued from the press,—among the latter, I may be pardoned, I am sure, for especially drawing attention to the exquisite illustrations of North American Butterflies contained in Mr. W. H. Edwards' invaluable work, which has now reached its Tenth Part. It speaks well, too, for the growing popularity of this branch of Natural Science, that Dr. Packard's useful "Guide to the Study of Insects" has already reached a *third* edition. A pleasing recognition of American Entomological work has recently, I may add, been manifested in England by the publication there in a collected form, of the writings of the late Dr. Brackenridge Clemens, on the *Tineina* of North America, under the editorial supervision of Mr. H. T. Stainton, the well-known authority in that department of Lepidopterology.

Apart, however, from the position attained by the growth of our Entomological literature, the Science has this year received a recognition that cannot fail to be of great and permanent benefit to it. I allude to the formation of a special sub-section of Entomology at the recent meeting of the American Association for the advancement of Science. It will now be practicable for American Entomologists—to whatever part of the Continent they may belong, whether to a Province of the Dominion

or a State of the Union, from the Atlantic to the Pacific—to meet together for mutual conference on matters Entomological. Questions affecting the Science in general can hardly fail to arise from time to time, and demand the consideration, and, possibly, the decision of some such united council. Certainly, the proceedings of such a gathering will be of great interest and value to all who take part in them, if not, indeed, to the whole circle of Canadian and American Entomologists.

At the informal meeting at Dubuque, in August last, one subject was specially brought forward for discussion,which I cannot forbear alluding to more particularly here, especially as it may justly be considered the great question of the day in the Entomological world. I refer to the subject of the Specific and Generic Nomenclature of Insects. For some few years past indications have not been wanting of a growing inclination amongst the mass of Entomologists to resist the efforts made by some few able and distinguished writers to impose, year after year, new sets of names upon our common insects. This has been done partly by the revival of the long-forgotten names published at the close of the last century, or the beginning of the present one; and partly by the perpetual formation of new genera, and the re-distribution of species. The ability of the writers and the good work they have done in other respects, have caused these annoying changes to be acquiesced in for the most part, even though the object in view appeared to be rather the exhibition of their powers of research among antiquated tomes, or the supposed immortalization of themselves by the attachment of their own names to those of our familiar insects. I do not say that these men were actuated entirely by such motives, but assuredly one can hardly be accused of ill-natured criticism in ascribing much of the work to such causes. All must admit, I think, that nomenclature is but a means to an end, and that end is surely best attained by the preservation of all names that have been in universal acceptation for a period of years, and that cannot be set aside without disturbing the cabinets of every Entomologist in the land.

Matters in this respect have been brought to a climax by the recent publication of Mr. Scudder's "Systematic Revision of some of the North American Butterflies." I esteem Mr. Scudder so highly as a friend, and value so greatly the good scientific work that he has done, that it pains me exceedingly to say a single word against anything that he may put forth. His projected "revision," however, is so sweeping and so revolutionary that I cannot forbear to make some remarks upon it. I know that his scientific labours are perfectly unselfish, and that he is entirely destitute of

any of the conceit that I have just now referred to; I feel sure, too, that he is actuated only by the desire to benefit the science; yet I do deeply deplore the mode that he has adopted, and am convinced that if his views are pressed, a very great obstacle will be thrown in the way of the advancement and popularization of this department of Natural History. We all, I am sure, look forward with eager anticipation to the publication of his great work upon North American Butterflies, and have no doubt that it will be the most complete, the most scientific, and the most conscientious work of the kind in America, but assuredly its value will be very greatly marred and its general acceptance impaired, if he continues to insist upon all these radical changes.

To show you what these changes are, I will briefly state that in the pamphlet already published, and which is intended as a forerunner of the author's great work on the Butterflies, the following alterations are made in the received nomenclature:—The 228 species enumerated are distributed among 96 genera—almost a genus for every two species; of these 96 genera, 42 are entirely new, and 39 others are obsolete names of Hubner and others that have never been generally adopted; there are thus 15 familiar generic names left, but of these several are transferred from their present position to entirely different groups of species; for instance, the name of *Papilio* is removed from the genus of 'Swallow-tailed Butterflies,' and handed over to the sole use of the insect at present known as *Vanessa antiopa*! Further, among the 96 genera there are no less than 45 that include but a single species apiece; and among the 228 species there are only 16 left with their present names unchanged! These figures are surely quite enough to show that I have not misapplied the terms 'sweeping,' 'revolutionary,' and 'radical,' as characterizing this work of revision. I would, then, most earnestly entreat Mr. Scudder, for the sake of the science itself, to re-consider his projected changes,—to discard all antiquated names in favor of those that have been for years in general acceptation, and to reduce his list of new genera to as small a number as he conscientiously can. If he does not, if he persists in his revision, I fear that his great work—most valuable as it will undoubtedly be in all other respects—will introduce more confusion, trouble and discord into American Entomology than a generation can get rid of. If these difficulties can be avoided in no other mode, it will remain for us all to unite together and agree to ignore all old forgotten names that may be brought forward, and retain all remaining of familiar species, until a general settlement of the question can be satisfactorily arrived at.

I fear, gentlemen, that I have now completely exhausted your patience; I shall therefore hasten to a close. But before doing so, let me remind you that, since our last annual meeting, our Society has lost by death one of its most valued members, Mr. B. Billings, of Ottawa, Ont. He was one of those devoted lovers of science who do good service by their honest, hearty work, but who, from their innate modesty and retiring disposition, shrink from all publicity. At times he contributed valuable papers to our little periodical, but he could never be induced to make any display of the knowledge he had acquired by his patient dilligence both at home and in the field.

Permit me now, gentlemen, to resign into your hands the office that you have done me the honor of investing me with. I thank you for your kindness and courtesy towards myself and my colleagues, and with every wish for the continued success and prosperity of your Society,

I have the honour to be, gentlemen,

Your obedient servant,

CHARLES J. S. BETHUNE.

Trinity College School, Port Hope,
September, 1872.

ON MR. SCUDDER'S SYSTEMATIC REVISION OF SOME OF THE AMERICAN BUTTERFLIES.

BY AUG. R. GROTE.

We have here before us a paper by an accomplished scholar, on a subject dear to us from our own studies. Mr. Scudder's Revision presents two main points for our consideration. The first point affects the sequence of the Butterflies in a systematic arrangement; the second the application of the scientific law of priority. As to the first, the considerations which have influenced Mr. Scudder to side rather with Ochsenheimer than with Boisduval, where the present Revision is not original, are evidently not lightly taken. Mr. Scudder's strong perceptions must contrast agreeably with the superficiality of those writers who find an excuse for the most heterogeneous linear arrangements on the plea that resemblances are diverse *(netzartige verwandschaft.)* who stay not to discriminate between degrees of similarity. On this first point one shall criticize Mr. Scudder, who has a large comprehension of the subject, and whose argument shall ignore trivialities.

On the second point, and one which is minor in theory, but in practice more important, we have to say: Mr. Scudder restores obsolete terms for sub-divisions higher than genera, and disregards the family and sub-family terminations lately rendered common in Zoology, chiefly by English writers on insects. On occasion, we think the propriety of this restoration doubtful, and that the law of priority does not come into question. Where the older author *meant* by his names what Mr. Scudder now declares, the older name should stand without doubt. And here we owe Mr. Scudder a debt of gratitude for his bibliognostic information. But, if such values are recognized, is it not better to give the usual terminations in *idæ*, *inæ*, and *ini* to the terms for families, sub-families and tribes. Two *families* in the Latreillean sense (*Papilionidæ* and *Hesperiidæ*,) are represented by the insects Mr. Scudder discusses, and, while we cannot doubt that they contain natural assemblages of genera of sub-family and tribal value, we are unprepared to support this view against Mr. Scudder's divisions, which are not explained by diagnosis. And while we cannot contest the value of the most of Mr. Scudder's genera, we may more often differ as to the application of the law of priority in the choice of generic names. The value of Hubner's *Verzeichniss* (1816,) and its use by Mr. Scudder, is a case in point. Notwithstanding Ochsenheimer's repudiation, Guenee's sneers, and Lederer's contemptuous patronage, Hubner's genera are now in great part becoming recognized, and his names available to science. This quiet, unobtrusive man has written what has endured half a century of abuse and intolerance, to be found greatly true. We have elsewhere (*Cuban Zygaenidæ*) written what we thought of Hubner and his generic conceptions. Let us see now how Mr. Scudder uses him sometimes. On page 59 Mr. Scudder adopts *Zerene* for a genus of which *Papilio caesonia* is type, and says: "Since the typical species of *Zerene* of Hubner fall into the much older genus, *Colias*, the name may be retained for the last species, *Pap. caesonia* of Stoll. That this ought to be preferred to *Meganostoma* of Reakirt follows from my suggestion in 1862, that the former should be retained for the two species here cata logued." But Hubner's *Zerene* is synonymous with *Colias*; no subsequent "suggestion in 1862" can alter Hubner's meaning in 1816. Hubner does not autoptically know all the species he cites; hence we must always take with him the first species as his types. If to *Zerene* we cite *Scudder* (1862,) the name is logical and, in this case, must be discarded at once so as not to interfere with the priority of a well established genus of *Geometridæ*, of the same name. *Meganostoma* must be retained.

If we apply similar considerations to several others of Mr. Scudder's genera, we shall remove in great part what is objectionable, and ***bizarre*** *(e. g.*, the use of *Papilio* for *Van. antiopa,)* remembering that the older authors always cited, as a matter of duty, all previously published names, even without note of identification, and that therefore they are not to be held liable for *all* the contents of their genera. Without questioning any of Mr. Scudder's statements on page 37, with regard to the use of the name *Papilio*, we yet know that Linnaeus applied it to his *Equites* first. Schrank's wide "limitation" can, then, have no priority in reason, nor the new restriction by Mr. Scudder against a well established use for a genus of which *Papilio machaon* is the conceded type. Let us disintegrate *Papilio* quickly; it must sorely need it that such means should be prescribed for the end.

We may differ with Mr. Scudder occasionally on matters of synonomy *(e. g., Thecla calanus* and *inornata,)* but we follow him admiringly in his conscientious generic definitions, and are ever ready to sink the critic in the disciple.

DESCRIPTION OF A REMARKABLE VARIETY OF LIMENITIS MISIPPUS.

BY THEODORE L. MEAD, NEW YORK.

While in the Catskill Mountains this summer, I met with a very curious variety of *L. Misippus* in which the conspicuous black stripe crossing the secondaries was altogether absent, and the corresponding mark on the primaries only indicated by a dusky cloud extending to the median nervule and enclosing no white spots. On the underside the differences remain the same. In the ordinary type, there is a whitish cloud around the cross stripe. In the variety under consideration this is quite distinct. The marginal row of greenish lunules is obsolete, but the submarginal white ones are enlarged so as to leave no black between the lunules and the buff ground-color on the secondaries, and but little on the primaries. On the upper surface, these lunules are rather large on the fore wings, but otherwise as in the usual type. The specimen was a female.

It is noticeable that this variety is a nearer approach, in general appearance, to *D. Archippus*, which, as is well known, enjoys almost entire immunity from ordinary foes. We may fairly assume that had not the Entomological collector intervened as an unexpected factor in the problem

of the "Struggle for Existence," our present variety, protected above its fellows by a closer resemblance to the distasteful *Danais*, might have given rise to a new species, and that, in less time than is generally assumed to be necessary for specific changes; as this variety would be thought to present quite sufficient specific differences, were it brought from a distant region.

In examining a number of butterflies offered for sale to the American Museum of Natural History, I found a curious variety of *Limenitis ursula*. Above, the markings are the same, but with the substitution of fulvous for blue, except in the marginal lunules, which are white with a faint bluish tinge. Below, the suffusion is very conspicuous and the secondaries in color and marking considerably resemble those of *Misippus*. It is not impossible that the specimen may be a hybrid between these two, as I have seen offspring resulting from the union of such dissimilar species, as *Smerinthus Tiliæ* and *Populi* of Europe, showing the characteristics of both. Should the *ursula* be merely a variety, it would furnish an excellent illustration of the way in which *Misippus* probably originated.

A NEW HESPERIAN.

BY G. M. DODGE.

Hesperia Illinois. N. sp.

Male expands 1.3 inches. All the wings dark brown above. The primaries throughout the middle and basal areas sparingly sprinkled with fulvous scales. This color is deepest around the stigma, which consists of a velvetty black bar extending obliquely from near the middle of the submedian vein to the cell, and is often divided into two equal parts by the fourth median veinlet. A large square patch, not sprinkled with fulvous, occurs in the middle area at the termination of the cell; and a small detached yellow spot lies immediately below, and outward from the anterior termination of the stigma. The base and middle of the secondaries are covered with long yellowish hairs. Fringe on all the wings white. Underside fulvous, inclining to ferruginous; the internal half of the primaries smoky, shading into black at the base and inner margin; two small yellowish spots near the centre (very distinct in some specimens, in others nearly obsolete) seem reproduced from above. That nearest the apex is round, the other is larger and somewhat reniform. On the

secondaries the fold is smoky; a broad band of fulvous precedes it, extending from the base to the outer margin; on the remainder of the wing the color is paler, and all the veins white and conspicuous. Fringe of all the wings brown, becoming white at the internal angles.

Above, head and thorax fulvous; abdomen black; its sides partly clothed with whitish-yellow hairs; palpi fulvous, tipped with black. Below, abdomen and palpi white; breast mouse-coloured. Antennæ annulated; above, brown; below, whitish-yellow; underside of club red.

The female expands 1.5 inches and is like the male, with the following exceptions: The stigma is wanting, and the fulvous on the primaries above is very obscure, being most apparent along the costa. Two small, semi-transparent yellow spots occur near the middle of the primaries; the one nearest the apex being so small as to be indistinct; the other is a little larger.

Variety *A*, ♀. Same as above, but the two spots in the centre of the primaries are much larger; the upper is triangular, the lower and largest nearly square. Three linear spots of nearly equal size appear between the subcostal veinlets, near the apex, and a long rectangular spot surmounts the submedian vein about half way between the base and outer edge of the wing. All these spots are reproduced below.

This species was discovered by Mr. E. A. Dodge, in Burcan County, Illinois. The first specimen was taken June 20th, 1872. It was quite abundant upon grassy slopes on the high rolling prairie that forms the divide between the Illinois and Rock rivers. Over forty specimens were taken, nine of which were females. Two weeks later *Hesperia Pawesheik*, Parker, appeared abundantly in the same locality.

The writer will exchange specimens of either of the above-mentioned species for most of those North American butterflies not of common occurrence in Northern Illinois.

MISCELLANEOUS.

VANESSA ANTIOPA, OR PAPILIO ANTIOPA?—The unusual abundance of this insect in many parts of Europe the present year, and its great influx into England, have given it unusual prominence in late numbers of our trans-Atlantic Entomological periodicals. I have been a little interested in watching to see how many of the writers would follow our friend Scudder's "Revision," and call the insect "*Papilio Antiopa*," and have not yet met with one.—C. V. R., ST. LOUIS, MO.

VANESSA ANTIOPA.—The present autumn has been remarkable for the appearance in scattered localities all over the country of one of our rarest and most beautiful butterflies, the Camberwell Beauty, *Vanessa Antiopa*, very few British specimens of which exist in our cabinets. The *Entomologist* records the capture of upwards of 200 specimens in all parts of the country, from the Channel Islands to Aberdeen. It is very remarkable that they nearly all differ in colouring to a perceptible extent from the Continental variety, the border being creamy white instead of buff-coloured. If they are genuine natives their spasmodic appearance in this manner is very singular, and worthy of careful observation. Several other rare butterflies, especially *Argynnis Lathonia*, *Pieris Daplidice*, and *Colias Hyale*, have also been unusually abundant this season.—*Nature.*

THE RADISH BUG.—A NEW INSECT. (*Nysius raphanus*, N. sp.)* This insect has never heretofore been described; the reason, we suppose, is that it has not hitherto attracted the notice of farmers and gardeners as a destructive insect. We have noticed it this season, for the first, attacking radishes, mustards and lettuce; some have noticed it on cabbage, others on grapevines, and in Kansas it is doing great damage to the potato crop, and we are informed that a very similar, if not the same species, attacks corn to an alarming extent; but, as we have not as yet seen the species from corn, we cannot say that they are identical, but

*NYSIUS RAPHANUS, N. sp.—Body long, with numerous short hairs; head and thorax cinerous; eyes black; scutel blackish; antennæ pubescent, four-jointed, chestnut brown, first and third joints about equal length, second, long as first and third, last, longer and thicker than third; hemelytra semi-transparent, punctured, with brown nervures, outside at base hairy, interior terminal margin bound with a dark band, separated by the medial longitudinal nervure, membranous at tip; rostrum nearly as long as the antennæ, four-jointed, extends a little beyond the origin of the posterior feet, blackish, paler at base; coxæ honey yellow; legs hirsute; posterior femora blackish; anterior and middle brown; tibiæ light brown, two tibial spurs; tarsi three-jointed—first as long as second and third, third longer than second—tarsal claws black; abdomen of males black; females black above, beneath a whitish band near the base, from the band to the tip pale; length to tip of hemelytra one-eighth of an inch; rostrum one twenty-fourth of an inch.—WM. R. HOWARD, Forsyth, Mo.

suppose that they are. It seems to be almost a general feeder, as it is not confined to any particular order of plants for its food, though in this locality it seems to confine its ravages mostly to CRUCIFERÆ. They will congregate on the plant as long as there is room for one of them, and continue sucking the life-supporting juices, which soon causes the plant to wilt and die. They are very active, and, when disturbed, swarm like so many gnats, which they more resemble, when flying, than anything else. In the morning, while the due is on the plants, they are found concealed in the shriveled up leaves, and are rather sluggish; and by plucking these and putting them into an old tin pail, with live coals of fire at the bottom, many of them may be destroyed. Lime has been tried to a slight extent, but seemingly without effect. We have not discovered either the eggs or the young, yet like their cousin, the chinch bug, wet weather is unfavorable to their production, and after a heavy rain it will be difficult to find many of them for several days. We give herewith the first description of this insect, to our knowledge, that has been written. The specific name, *raphanus*, was given it from its food plant, the radish, upon which we first noticed it. It belongs to the sub-order *Heteroptera;* and, like most insects of that order, is not by any means destitute of that unpleasant "bed buggy" smell. We hope by the end of the season to be able to procure the eggs and young, and to be able to write a more complete history.

NOTE ON HESPERIA COMMUNIS, *Grote.*—This species, which is described as *Syricthus communis* on page 69 of this volume, is identical with Mr. Scudder's *Hesperia tessellata*, described in the Fourth Annual Report of the Trustees of the Peabody Academy of Science, Salem, 1872. As I learn from Mr. Edwards and Mr. Scudder, my description was written in 1871 and published in April, 1872. Mr. Scudder's paper, in which his description of this species occurs, was, according to page 1 of the Report, "read, accepted and ordered to be printed," Jan. 13th, 1872. I do not know the exact date of the issue of the Report from the press. A similarity of name with that proposed by Mr. Scudder, in an European species (*H. tessellum*) might assist in according a preference to the name I have proposed as above for our American species.—A. R. GROTE.

THE AMERICAN ENTOMOLOGIST.—I have a few bound copies of the two volumes of this periodical, which I will send post-paid by mail upon receipt of $3.50 per volume, or $6.50 for both. Address C. V. RILEY, Room 29, Insurance Building, St. Louis, Mo.

The Canadian Entomologist.

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MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 209

YPSOLOPHUS.

1. Y. eupatoriella. N. sp.

Tongue dark brown; basal joint of the palpi, and the second joint externally, and on the under surface, dark brown; upper surface pale ochreous; tip white; third joint dark ochreous, tipped with dark brown. Head pale bronzy brown, with purplish reflections, each scale tipped with white. Sides of the thorax and base of the wings ochreous yellow, *extending along the costal portion of the wings, gradually narrowing to about the middle of the costa.* A median, longitudinal, wide, violaceous, brown band extends over the thorax and *along the extreme dorsal margin of the wings*, gradually becoming lighter in color till about the middle of the dorsal margin it unites with a bluish-purple wide band, which crosses the wing just behind the middle, gradually passing on the costal margin into the ochreous portion. *Upon the fold, beginning near the base,* is a velvetty deep black stripe which extends, gradually widening, to the bluish-purple band, and is deeply scalloped next to the ochreous portion of the wing, which it separates from the dorsal margin. The bluish-purple band is narrowly margined externally by an ochreous line, followed by a narrow black line, behind which, to the apex, the wing is dark brown with faint ochreous or purplish reflections, the ciliæ also being of the same hue, with a row of eight or nine small ochreous dots or streaks extending around their base. Under surface and legs bronzy dark brown; tarsi annulate with pale ochreous.

The larva is greenish-white, over half an inch long. It feeds upon the under side of a folded leaf of *Eupatorium ageratoides*, folding it so as to apply one of the large veins to the midrib. It became a pupa under the folded edge of the leaf, July 12, and the imago emerged July 20. It is much the handsomest species of the genus known to me.

2. Y. Reedella. N. sp.

Palpi yellowish-brown, paler on the internal surface of the second and upper surface of the third joint. Tongue brownish. Face grayish-white. Antennæ, head and thorax slightly iridescent, pale yellowish-brown, faintly suffused with roseate; there is a large brown spot on the centre of the anterior margin of the thorax, which sends a narrow streak to each side of the apex, and a brown spot on each side in front of the wings. Anterior wings suffused and dusted with brown upon a ground color of yellowish-ochreous, especially along the dorsal margin towards the base. Two large spots on the disc, and the apical portion of the wing dark brown. (To the naked eye the spots appear rather to be irregular, not well defined fasciæ.) About five minute brown dots around the dorso-apical margin, one of which is at the extreme apex. Ciliæ fulvous. Posterior wings very pale fuscous with a silvery tinge. Abdomen shining ochreous yellow, dusted thickly with brown, and with a dark brown, rather wide streak on the tergum, extending from the base half way to the apex; venter pale ochreous yellow, with a distinct dark brown spot on each side of each segment, and a faint one in the middle. Under surface of the thorax white, legs brown on their anterior surfaces, tarsi brown, annulate with white. *Alar ex.* 5/8 inch. Larva unknown. Captured in September at the lamp.

The vertex is narrow elongate. Wings rather elongate in proportion to width. Abdomen conical.

Named for Mr. E. B. Reed, of the CAN. ENT.

Possibly this may be a variety of *Y. pometellus*, Harris, but I think it is different. I have other specimens agreeing with some of Dr. Fitch's varieties of *pometellus*, but I am by no means sure that he is right in regarding them as mere varieties. Harris and Fitch place all these species in *Chætochilus*, Steph.

3. Y. quercipominella. N. sp.

Palpi dark purplish brown, sprinkled with white on the under and outer sufaces; upper and inner surfaces and tip pale ochreous. Tongue and maxillary palpi pale purplish-brown. Antennae dark purplish brown. Head, thorax, and costa at the base, ochreous yellow, tinged with purplish fuscous in some lights. Costal half of the wings, beyond the base, pale ochreous, with a row of minute dark brown dots on the costa; dorsal half dark purplish-brown, twice faintly notched in the basal half. An ochreous streak around the dorso-apical margin, containing about six small, dark purplish or brown dots. Costo-apical ciliae ochreous, extreme

apical ciliae purplish brown, dorso-apical ciliae ochreous, streaked with purplish brown. Posterior wings and ciliae pale slate color. Abdomen purplish-brown.

The vertex and anterior wings are very much elongate and narrow, and the abdomen is sub-depressed. *Alar ex.* 5/8 inch.

The larva feeds in the "Oak Apple" (gall of *Cynips spongifica*, Harris.) Head yellowish, body green, dorsum dusky green, with two longitudinal whitish lines (which, under the lens, appear to be made of small spots.) Two curved black lines on top of the first segment, and two black spots on each side of it; eight black spots on each of the next three segments, and five on each of the remainder, except the penultimate and ante-penultimate. It became a pupa June 7th, and the imago emerged June 16th. Kentucky.

The wings do not differ from Dr. Clemens' description of *Y. flavivittellus*, but he says: "head, antennae and palpi fuscous."

This resembles, but I think is different from *Y. (Chætochilus) contubernalellus*, Fitch.

4. Y. querciella. N. sp.

Tongue yellowish, except the basal part, which is brown. Palpi yellowish on the inner surface, brick red, suffused with fuscous on the outer surface, especially at the base of the second joint. Antennae pale yellowish, the apical half of each joint brown on the upper surface. Face pale yellowish, slightly iridescent. Vertex, thorax and anterior wings pale brick red, with a pink tinge, the wings sparsely but distinctly dusted with dark brown, especially the apical portion, and with nine small dark brown dots around the apex. Abdomen ochreous yellow above, brownish beneath, with two pale ochreous yellow lines. *Alar ex.* over 3/4 inch. Kentucky.

The mature larva is nearly one inch long; when nearly mature, the first segment and head are grayish ferruginous with a tinge of rufous; remaining segments greenish, with the posterior margin of each whitish. There are two dorsal longitudinal white lines, and one on each side, and six to eight black spots on each segment. Before becoming a pupa it became bright brick red on top, and pinkish-yellow on the sides. (Another instance of the colors of the imago assumed by the larva.) It became a pupa June 2nd, and the imago emerged June 11th.

This is, in one respect, a singular insect. It is much larger and more robust than the preceding species (*Y. quercipominella*,) but in all other

respects the structure of the two insects is identical, except that while the forewings of that species are very long and narrow, and almost pointed, in this their width *at the apex is more than one-fourth of their length, with the costo-apical angle rather sharply, and the dorso-apical very obtusely rounded, and the apex oblique and a little concave.* Yet the neuration does not differ. There is a similar difference in the shape of the hind wings, but none in the neuration. But for the palpi, it would, in external appearance, resemble a *Tortrix.*

5. Y. caryæfoliella. N. sp.

Tongue yellowish, except at the base, where it is brownish. Palpi dark purplish-brown, except the inner surface, which is pale yellowish, and the apex of the tuft, which is dusky grey. Head, antennae and thorax reddish-golden, suffused with fuscous, in some lights appearing dark golden, in others reddish-brown. Antennae with pale annulations. Anterior wings with a silky lustre, dark yellowish-red suffused with fuscous, shining, some portions of the wing appearing almost slate color, whilst others are dark purplish-red, changing with the light; two or three minute blackish dots upon the disc; posterior wings plumbeous. Legs brown upon their anterior, yellowish on their interior surfaces. *Alar ex.* 1⅛ inch. Kentucky.

The structure of this insect is identical with that of the preceding (*Y. querciella*), except that the anterior wings are scarcely so wide in proportion to their length. It resembles it closely, but may be distinguished by the slightly narrower wings, which have a little wider expanse and have more of a deep dull red, and are not of so bright a brick red.

The larva sews together the leaves of Hickory trees (*Caryæ alba.*) When taken (June 6th) it was about ¾ of an inch long, green, with six narrow, and some of them interrupted, white stripes which did not quite reach the anal segment; head ferruginous; the following segment brown; true feet black. The next day it became white suffused with pink, and the longitudinal stripes became deep pink. On the 10th it became a pupa, and on the 23rd the imago emerged.

I should regard this as a variety of *Y. querciella* but for the decided differences in the larva.

6. Y. Straminiella. N. sp.

Tongue and second joint of palpi brown, faintly tinged with golden; third joint and apex of the second, pale straw colour. Antennae pale straw colour, each joint tipped above with brown. Head, thorax and

anterior wings pale straw color, thickly dusted with brown. (By artificial light under the lens the dusting becomes golden brown, or bright reddish-golden.) In the apical part of the wing the dusting is dense and assumes the form of an indistinct, irregular, transverse line. Four small spots of the same hue with the dusting, one above the fold, not far from the base, two others opposite each other about the basal fourth, one on the fold, the other on the disc; the other which is, rather, a short streak, about the middle of the wing, the four forming an elongate coffin-shaped figure. (The spots and dusting are only visible under the lens, and to the naked eye, the wings appear of a straw color with a satiny lustre.) Posterior wings silvery, their ciliae straw color. Abdomen conical, straw color dusted with brown. Legs brownish; tarsi brown, annulate with white. *Alar ex.* ⅞ inch. Captured June 16th, in Kentucky. Larva unknown.

The vertex is not greatly elongate, and the wings are rather wide in proportion to their length, and the antennae are microscopically pubescent. I think it must resemble closely *Y. punctiaiscellus*, Clem.

SAGARITIS,* *gen. nov.*

In the absence of any extended means of reference to the works of European Entomologists, and being unable to locate the species below described in any genus known to me, I have been led to establish for it this genus. Possibly it may belong to *Chætochilus*, Steph.

Slender, graceful in appearance. Legs rather long; wings narrow. Maxillary palpi minute, tongue moderate; labial palpi long, recurved, the terminal joint acicular, and almost hidden by the tuft of the second joint, which projects *upwards* and forwards, instead of *downwards* and forwards, as in *Ypsolophus* (which otherwise resembles this genus as to the head and palpi.) Vertex narrow elongate. Antennae slender, simple, more than half as long as the wings.

Anterior wings elongate, narrow, faintly falcate beneath the apex. Discal cell closed; the costal attains the margin just behind the middle; subcostal, furcate near the margin, which it attains before the apex, and sending off in its course three branches to the costal margin, one from about the middle, one before the discal vein, and one at the discal vein. Median, furcate beyond the discal vein, both branches attaining the dorsal margin at about the apical fifth; the discal vein sends off three branches, all of which attain the posterior margin behind the apex, the upper branch being furcate; sub-median furcate near the base. Posterior wing a little

Sagaritis—A wood Nymph.

wider than the forewing, falcate beneath the apex; discal cell short, rather wide, closed by a bow-shaped, oblique discal vein; costal vein and basal portion of the subcostal almost coincident with the costal margin, the subcostal curving downwards towards the discal vein, and again upwards from the discal vein to the apex, before which it becomes furcate, sending a branch to the costal margin above, and another below the apex; the discal vein sends a branch to the dorsal margin from its middle; the median is furcate from the discal vein, and sends a branch to the posterior margin from about the middle of the cell; submedian and internal, simple.

It therefore approaches *Ypsolophus* in the neuration, as well as in the palpi. It is still more nearly allied to *Anorthosia*, Clem., but the neuration is quite distinct.

S. gracilella. N. sp.

Pale ochreous yellow. A small brown spot on the costa near the base, another on the fold about midway of the length of the wing, and another nearly opposite it near the costa. A row of small brown spots extending around the apex. Wing sparsely and faintly dusted with brown. *Alar ex.* not quite ¾ inch. Kentucky. Larva unknown.

The body is slender and the legs rather long. A single specimen was taken May 7th, resting upon the trunk of a tree. When disturbed it fluttered around for a moment, re-alighting always on the same tree.

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 4

BY E. T. CRESSON,

Continued from Vol. 4, Page 84.

Genus MICROCTONUS, Wesm.

MICROCTONUS AGILIS. *N. sp.*—♂. Piceous, shining; clypeus and mandibles testaceous; palpi whitish; antennæ longer than head and thorax, slender, fuscous, basal third pale; pleura beneath, rufo-piceous; tegulæ whitish; wings hyaline, iridescent; nervures and stigma fuscous, the latter large, lanceolate; marginal cell longer than stigma, lanceolate; legs, including coxæ, pale honey-yellow, extreme tips of posterior tibiæ dusky; abdomen smooth, shining, depressed, first segment tinged with rufo-piceous, gradually dilated to apex. Length .10 inch.

Hab.—Illinois. One specimen.

Genus EUPHORUS, Nees.

EUPHORUS SCULPTUS. *N. sp.*—♀ Black; head shining, pale yellow-ferruginous; spot enclosing ocelli, and occiput black; palpi fuscous; antennæ long, slender, entirely black; mesothorax finely punctured, somewhat shining; scutellum, metathorax and first abdominal segment densely rugose, opaque; metathorax broad, abruptly truncate behind; tegulæ rufo-piceous; wings faintly dusky, nervures and stigma fuscous, the latter broad; legs dull ferruginous, coxae black, four posterior trochanters, femora at base, and more or less of their tibiae and tarsi blackish; abdomen beyond first segment sub-ovate, flattened, smooth and polished; first segment broadly dilated at tip; ovipositor pale, nearly as long as abdomen, sheaths black and thickened at tips. Length .15 inch.

Hab.—Illinois. One specimen.

EUPHORUS MELLIPES. *N. sp.*—♂. Black, shining; face with dense silvery-white pile; clypeus and mandibles, except tips, pale ferruginous; palpi pale; antennae pale ferruginous, more or less dusky toward tips, the joints short and distinct; thorax gibbous, minutely sculptured; metathorax rounded, opaque, coarsely granulated; tegulae pale; wings hyaline, iridescent, nervures pale yellowish, stigma fuscous, paler at base; legs, including coxae, honey-yellow, tips of posterior tibiae and more or less of their tarsi dusky; abdomen small, sub-ovate beyond first segment, depressed, smooth and polished, rufo-piceous; first segment gradually dilated to apex, longitudinally aciculated, black; venter pale rufo-piceous. Length .13 inch.

Hab.—New Jersey; Illinois. Three specimens.

EUPHORUS SCITULUS. *N. sp.*—♀. Head sub-globose, honey-yellow; spot covering ocelli and tips of mandibles black; antennae about as long as head and thorax, pale fuscous, honey-yellow at base, the joints short, pale sericeous; thorax honey-yellow, darker than head, mesothorax and scutellum fuscous; tegulae pale; wings hyaline, iridescent, nervures and stigma fuscous, the latter large, sub-triangular, marginal cell very short, about one-third the length of stigma; legs, including coxae, pale honey-yellow, posterior femora, tibiae and tarsi more or less dusky; abdomen smooth shining, fuscous, first and base of second segment honey-yellow. Length .08 inch.

Hab.—Illinois. One specimen.

Genus LEIOPHRON, Nees.

LEIOPHRON LAEVIS. *N. sp.*—♂. Deep black, shining; head small, face with a large shining prominence; mandibles dark rufous; palpi dusky; antennae about as long as body, black, scape dull rufo-piceous; thorax finely punctured, middle lobe of mesothorax prominent, as also the scutellum; metathorax opaque, coarsely rugose, rather abrupt posteriorly, on each side above a rather deep longitudinal groove, curving inwardly and meeting on posterior face; tegulae dull rufous; wings hyaline, faintly dusky towards apex, nervures and stigma pale fuscous; legs, including coxae, honey-yellow, posterior coxae blackish at base and beneath, tips of their tibiae and their tarsi slightly dusky; abdomen regularly fusiform from base to apex, first segment black, broad at apex, minutely and rather indistinctly aciculated longitudinally; remainder of abdomen piceous, smooth and polished. Length .20 inch.

Hab.—Canada. (Pettit.) One specimen.

Genus CALYPTUS, Haliday. (*Brachistes*, Wesm.)

CALYPTUS MAJOR. *N. sp.*—♀. Deep black, shining; head transverse, vertex and face irregular, densely punctured, the latter wide, occiput and cheeks smooth; eyes small; clypeus tinged with rufous; mandibles ferruginous, black at tips; palpi whitish; antennae as long as head and thorax, brown black, scape pale brown; thorax shining, mesothoracic lobes prominent, sometimes tinged with brown, central lobe truncate anteriorly, sutures coarsely crenulated; tegulae honey-yellow; wings faintly dusky, nervures and stigma black; legs honey-yellow, coxae and trochanters paler, posterior tibiae fuscous, pale at base, basal joint of their tarsi dusky; abdomen sub-compressed towards apex, smooth and polished, more or less tinged with piceous; first segment longitudinally aciculated; ovipositor as long as body, honey-yellow, sheaths black. Length .18—.22 inch.

Hab.— Canada; Virginia; Illinois. Four specimens.

CALYPTUS ROTUNDICEPS. *N. sp.*—♂. Black, smooth and polished; head nearly globose; mouth brown; palpi whitish; antennae nearly as long as body, slender, brown-black, basal third luteous beneath; tegulae, basal nervures of wings, and legs, pale luteous; wings hyaline, sub-iridescent, faintly dusky at tips, stigma and nervures piceous; apical half of posterior tibiae blackish behind; abdomen smooth and polished, depressed, basal segment longitudinally aciculated. Length .16 inch.

Hab.—Illinois. One specimen.

CALYPTUS TIBIATOR. *N. sp.*—♂. Black, shining; head transversely subquadrate; clypeus, except base, and mandibles, fulvous; palpi white; antennae brown-black above, fulvo-testaceous beneath; tegulae and basal wing nervures honey-yellow; wings hyaline, iridescent, stigma and nervures fuscous; legs pale luteous, spot on tips of posterior femora above, their tibiae except base, and tips of their tarsi, blackish; abdomen short, depressed, shining, two basal segments longitudinally aciculated when viewed under a strong lens, the first segment with two longitudinal carinae, converging at apex. Length .10 inch.

Hab.—New Jersey. One specimen. Smaller than *rotundiceps*, which it closely resembles.

CALYPTUS MEXICANUS. *N. sp.*—♂. Deep black, sub-opaque, clothed with a very short whitish pile; head transverse; mandibles and palpi brown; antennae brown-black; middle lobe of mesothorax with a central longitudinal ridge, the sutures broad and deep, meeting on the disc before posterior margin; two deep square depressions before scutellum; metathorax coarsely reticulated; depressions of pleura and pectus coarsely striated; tegulae piceous; wings hyaline, iridescent, slightly dusky at tips; legs black, more or less tinged with brownish, the four anterior tarsi pale fuscous; abdomen sub-convex, coarsely and longitudinally aciculated or striated, first segment with two prominent longitudinal carinae, converging towards apex, apical margin of second segment narrowly smooth and polished. Length .20 inch.

Hab.—Orizaba, Mexico. (Prof. Sumichrast.) One specimen.

Genus EUBADIZON, Nees.

EUBADIZON MACULIVENTRIS, Cesson, Trans. Am. Ent. Soc., Nov., 1872.

Hab.—Texas. One ♂ specimen.

EUBADIZON LATERALIS. *N. sp.*—♂. Pale honey-yellow; palpi whitish; spot covering ocelli and occiput fuscous; antennae nearly as long as body, fuscous above, testaceous beneath, pale at base; mesothorax except sides of middle lobe, scutellar region and metathorax above blackish; metathorax rounded above, smooth, without carinae; wings hyaline, iridescent, stigma and nervures fuscous; legs paler than body, tips of posterior femora, their tibiae and tarsi blackish, bases of their

tibiae narrowly whitish; abdomen sub-opaque, blackish above, apical corners of first segment, and spot at sides of remaining segments pale honey-yellow; ovipositor nearly as long as body, sheaths blackish. Length .14 inch.

Hab.—Illinois. One specimen. Much smaller than ***maculiventris***, and differently marked.

EUBADIZON PLEURALIS. *N. sp.*—♂ ♀. Black, smooth and shining; mandibles dull testaceous; palpi whitish; antennae long and slender, brown beneath, paler at base; mesothorax more or less tinged with testaceous; scutellum pale testaceous; pleura honey-yellow; tegulae and basal wing nervures whitish; wings hyaline, beautifully iridescent, nervures dusky, stigma pale, sub-hyaline; legs, including coxae, pale yellowish-white, tarsi more or less and tips of posterior tibiae dusky; abdomen entirely black, shining; ovipositor of ♀ rather longer than body, honey-yellow, sheaths black. Length .16—.18 inch.

Hab.—Missouri. (Riley.) Three specimens.

EUBADIZON AMERICANUS. *N. sp.*—♀. Black, shining; mandibles and palpi pale testaceous; antennae brown-black, as long as head and thorax, scape piceous above, testaceous beneath; metathorax rugose, with a deep depression on each side above, behind the middle; tegulae and basal wing nervures pale honey-yellow; wings faintly dusky, sub-iridescent, nervures and stigma fuscous, the latter large and sometimes black; legs, including coxae, honey-yellow, the tarsi and posterior tibiae except base, blackish; the first, and second except apex, longitudinally roughened, the remainder smooth and polished, base of first segment with two elevated carinae; ovipositor longer than body. Length .18—.20 inch.

Hab.—New Jersey. Ten specimens. Distinguished from ***pleuralis*** by the entirely black thorax, dark stigma and wing nervures and roughened base of abdomen.

Genus ICHNEUTES, Nees.

ICHNEUTES ABDOMINALIS, Cress. Trans. Am. Ent. Soc., Nov., 1872.

Hab.—Texas. (Belfrage.) One ♀ specimen.

ICHNEUTES BICOLOR. *N. sp.*—♀. Black, clothed with a very short whitish sericeous pile, very dense on the face; mandibles and palpi dull testaceous; thorax smooth and shining, metathorax opaque; tegulae honey-yellow; wings hyaline, iridescent, costal nerve black, lower margin

of stigma and nervures fuscous; legs, including coxae, honey-yellow, tarsi varied with dusky; abdomen fulvo-ferruginous, base of first segment and apical and lateral margins of third and following segments black; first and second segments opaque, roughened, remaining segments smooth and shining. Length .20 inch.

Hab.—Massachusetts. One specimen.

ICHNEUTES FULVIPES. *N. sp.*—♂. Black, shining, face and pleura clothed with pale glittering pile, longer and more dense on the face; mandibles and palpi dull testaceous; antennae dark brown; tegulae and space in front honey-yellow; metathorax rough, opaque; wings faintly dusky at tips, iridescent, costal nerve black, lower half of stigma and the nervures fuscous; legs, including coxae, pale honey-yellow, tarsi more or less tinged with dusky; two basal segments roughened, opaque, very obscurely tinged with dull rufous, remaining segments black, smooth and shining. Length .17 inch.

Hab.—Illinois. One specimen. This may prove to be the ♂ of *bicolor*.

(To be Continued.)

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 198.)

281. CHRYSOMELA CONFINIS *Kirby*.—Length of body 4½ lines. A single specimen taken in Nova Scotia by Capt. Hall.

Nearly related to the preceding species. Body oblong, obscurely bronzed green, grossly punctured. Palpi, antennae, legs, and rhinarium ferruginous: punctures of the prothorax scattered in masses, with the interstices very minutely punctured: scutellum bronzed: elytra reddish with a discoidal flexuose irregular pale stripe dilated at the base and towards the apex; there are also two flexuose dark-green discoidal stripes in the disk, the exterior one nearly reaching the base and the interior approaching nearer to the apex, between these towards the base is a single oblong green spot, and outside them are many irregular ones of the same colour; all these spots and stripes are convex and mostly circumscribed

by punctures; there is a double series of punctures diverging towards the base; and an oblique abbreviated one between these and the scutellum, as in many *Harpalidae*, &c.; the interstice between the double series is green at the base. There is a lateral series of punctures also as in *C. Philadelphica.*

[Synonymous with *C. Spiraeae* Say. Taken on Lake Superior by Agassiz.]

[212.] 282. CHRYSOMELA BIGSBYANA *Kirby.*—Length of body 4 lines. A single ♀ specimen taken in Canada by Dr. Bigsby. [Taken in Ontario.]

Colour and sculpture of the body like those of the preceding species, from which *C. Bigsbyana* differs principally in having the sides and the anterior margin of the prothorax reddish-yellow; the elytra are of the same colour, but the suture itself, especially at the base, a stripe parallel to it, a large humeral bilobed spot, the interior lobe of which is obtus-angular or broken, and several irregular dots and spots on the elytra are black-green.

283. CHRYSOMELA MULTIPUNCTATA *Say.*—Length of body 4¼ lines. Taken frequently in the journey from New York to Cumberland House. [Taken in Canada.]

Body, head, antennae, and legs ferruginous. Prothorax pale-yellow, with two posterior triangular ferruginous spots with a dot of the same colour between them; the punctures of the prothorax are more numerous and smaller than in *C. Philadelphica*, &c.; elytra yellowish-white; suture and a confluent stripe circumscribed with the double series of punctures, diverging towards the base of the elytra, ferruginous; surface covered with irregular greenish dots and short lines, as in the preceding species, a row of punctures marks the exterior side of the elytra, the interstice between it and the margin is immaculate and impunctured, the rest of the elytrum being thickly covered with scattered minute punctures.

[213.] 284. CHRYSOMELA CLIVICOLLIS *Kirby.*—Length of body 4⅓ lines. A single specimen taken in Canada by Dr. Bigsby.

Body between oblong and hemispherical, violet. Head punctured; labrum without punctures: prothorax elevated in the centre to an obtuse peak, from the summit of which descend several concentric channels which run nearly to the margin, the interstices of which are punctured: scutellum violet with a green tint: elytra reddish, punctured, punctures scattered with some tendency to arrange into rows; three large dark

violet spots distinguish the elytra, the first upon the shoulders subtriangular with the vertex truncated, the second near the apex bilobed, the third at the base forming with that on the other elytrum a large cruciform spot; suture violet: anterior thighs armed with two stout teeth.

285. CHRYSOMELA RUFIPES *De Geer.*—Length of body 2¾ lines. A single specimen taken in the Expedition.

[214.] The American differs a little from the British specimens. In the first place it is scarcely half the size, not only the mouth but the space before and between the eyes is rufous, only the vertex and occiput being black: the black spot of the prothorax, instead of consisting of two distinct spots connected only at their base, is only divided at its apex into two lobes, and the spots of the elytra though similarly arranged, are less distinct: they agree in having the body underneath, except the rufous anus, black; and the legs rufous.

[Taken on Lake Superior by Agassiz's Expedition.]

286. PHÆDON ADONIDIS *Pallas.*—Length of body 3-4 lines. Several specimens taken in Lat. 54°.

[215.] Body black, punctured, sprinkled underneath with cinereous hairs. Vertex rufous with an occipital black spot: prothorax reddish-yellow, with a large discoidal black spot reaching from base to apex and constricted anteriorly; on each side also there is a round black dot; scutellum black, impunctured: elytra reddish-yellow, thickly punctured with scattered punctures; suture black except at the base; a black discoidal stripe or blotch reaching neither to the base nor the apex, anteriorly obliquely truncated and posteriorly acute, also distinguishes these organs.

VARIETY B. With the discoidal stripe acute at each extremity and smaller.

VARIETY C. With the discoidal stripe evanescent.

[Taken at Fort Simpson, Mackenzie River, by Mr. Kennicott.]

287. PHÆDON RAPHANI *Fabr.*—Length of body 2⅛-2¾ lines. Several taken in Lat. 54°.

Body oblong, punctured, glossy; underneath black with the disk a little bronzed, above green or green-gold. Head and prothorax minutely punctured; five first joints of the antennæ bronzed and glossy; the remainder cinereous and obscure: scutellum impunctured, violet: elytra

very thickly punctured, punctures not arranged in rows: parapleura confluently punctured: disk of the postpectus bronzed and transversely striated with very slightly impressed striolæ.

In the female the abdomen, as in *Ph. Polygoni*, is often so distended with eggs as to make the elytra appear abbreviated.

VARIETY B. With the whole of the upper surface green, without any golden lustre.

[This and the two following species are included in the genus *Gastrophysa* Chev.]

[216.] 288. PHÆDON POLYGONI *Linn.*—Length of body 2 lines. Taken in Nova Scotia by Dr. MacCulloch and Capt. Hall. [Very common in Canada.]

Body oblong-ovate, punctured, glossy, underneath black. Head deep blue, with an abbreviated channel in the vertex between the eyes; antennæ piceous, with the first five joints rufous: prothorax convex, rufous: elytra deep blue, thickly punctured: legs rufous with piceous tarsi; anus rufous.

289. PHYLLODECTA VITELLINÆ *Linn.*—Length of body 2⅓ lines.

[217.] Body oblong, a little inclining to ovate, glossy; underneath black-bronzed, scarcely punctured; above bronzed with a copper tint, minutely punctured. First and second joints of the antennae rufous: scutellum impunctured: elytra punctured in rows, with the interstices indistinctly punctured: tarsi piceous with the first joint rufous.

[Taken on Lake Superior by Agassiz's Expedition; in Ontario, also.]

Family HALTICIDÆ.

290. HALTICA (ORCHESTRIS) VICINA *Kirby.*—Length of body 3½ lines. A single specimen taken.

Body underneath pale rufous with the disk of the postpectus black. Head punctured in the vertex, dirty-white, with a pair of contiguous black dots between the eyes and a subtriangular one on the nose; antennae black with the underside of the scape and the two next joints dusky-rufous: prothorax very minutely and lightly punctured, white with two irregular black spots placed obliquely on each side, and a black longitudinal streak between them: scutellum black: elytra very minutely and thickly punctured, with a sutural stripe common to both, a discoidal one rather nearer the lateral margin, and another just above it all black; the intermediate stripe falls short of the apex of the elytra: the upper side of the tibiae is dusky, and the tarsi are black.

[218.] 291. HALTICA (ORCHESTRIS) PUNCTICOLLIS *Kirby*.—Plate vii, fig. 9.—Length of body 2¾-3 lines. A single specimen taken in Lat. 65°. Taken also by Prof. Peck in New England?

Body subovate, very black, underneath glossy. Head irregularly punctured behind: antennae underneath piceous at the base: prothorax very minutely and lightly punctured, pale-yellow with two black round dots in the disk between which above the scutellum is a less black triangular impression: elytra very minutely and lightly punctured: forebreast pale-yellow.

VARIETY B. Elytra with a blue tint.

ILLUSTRATIONS OF NORTH AMERICAN ENTOMOLOGY.

We are indebted to the kindness of Prof. Townend Glover, Entomologist of the Agricultural Department, Washington, for the first part of his new illustrated work on our North American insects. This part contains thirteen finely colored plates, in which are figured nearly all our described Orthoptera. The engravings, which are very beautiful, are from copper plates, and are, both in design and execution, the production of the talented author. We deem this work, of which the first number is merely introductory, one of very great merit, and sincerely hope that our esteemed friend will be enabled to continue it until the whole of his valuable material, which has cost him many years of patient labor and study, and which includes figures of a large proportion of our insects of all orders, may be given to the scientific world.

We observe that this first edition of the first part, of fifty copies only, has been generously published at the author's own expense. It is not to be expected that so costly a work could be undertaken by any private individual; we trust, therefore, that the Department of Agriculture, which he has so long, ably, and faithfully served, will at once recognize the value of his labors, and that upon their recommendation, Congress will, with its accustomed liberality in all scientific matters, make such appropriation as may enable the author to give the world the benefit of his patient and persevering study; the more especially as this work will treat of the many insects injurious to vegetation, and will therefore be of immense practical value to Agriculturists as well as to Entomologists.

NOTES ON SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, LONDON, ENGLAND.

Genus *Chalcis*.

This genus comes next to *Smicra*, which has the greatest development of the peculiar characters of the family *Chalcididae*, such as the compact antennæ, the robust body, the large quadrate prothorax, and the much dilated hind thighs. In all these characters this family agrees with *Leucospidae*, from which it totally differs in the structure of the abdomen, and the two families have a supremacy of structure which is not wholly shared by any other in the tribe *Chalcididae*. *Chalcis* is followed by *Haltichella*. In the latter, which attains its largest size in Australia, the above structure is less prominent, the insertion of the antennæ descends from the snout towards the mouth, and the flagellum is more whip-like and has more active vibration, and resembles that of some species of *Encyrtus*, to which genus *Haltichella* has also a resemblance in the shortness of the ulna vein. Unlike *Smicra*, which chiefly dwells in S. America, *Chalcis* is spread somewhat equally and extensively over the globe. It consists of numerous forms which are generally closely allied to each other in structure and colouring, and are not easily distinguishable, and suggest the idea that species are now determinate and concise by the obliteration of former links, and that in some cases these links are not yet extinct. The respective differences of these species require to be concisely shown in a synopsis. In a few forms the abdomen of the female departs much from the usual structure, the apical part being attenuated and nearly cylindrical; an example of this occurs in the Amazon region and another in Arabia. In another case the male has pectinated antennæ, and has been considered as a distinct genus. *C. Healegon*, an Australian species, has red antennæ and a red abdomen, and thus differs remarkably from the rest, the colour being almost always black, the legs varied with yellow and sometimes partly red. *C. minuta*, a Canadian species, occurs in England and is more frequent in S. Europe; it also inhabits the U. S., and is probably identical with *C. annulipes*, so named from West Indian specimens, and it may be supposed to have spread northward in both continents, and we have but to assume a continuous belt of tropic land in former times, round the globe and connecting continents in the Atlantic and Pacific, and alternate change of climate, and then the more or less extent of insect species becomes a mere question of time. *C. flavipes*

inhabits S. Europe, and also occurs in China, and was probably there and in Hindostan before it came into Europe. These two species are thus examples of the two affinities of the European insect race, one with North America, the other with North Asia, and both increasing northward. Many genera of insects may be traced from the tropics northward, and their species may be observed in successively smaller circles till they attain their highest latitude. The distribution of the insect race by migration, and the variety thereby of their kinds in different regions, afford far greater proofs of the design, and contrivance, and wisdom of the Creator, than would have been manifested by their immediate appearance in the spots where they now exist.

MISCELLANEOUS.

MELITÆA HARRISII.—Mr. W. H. Edwards, of Coalburgh, W. Va. has, during the past summer, reared the larva of *Melitæa Harrisii*. It was found feeding on *Actinomerus squarrosa*, a composite plant allied to *Helianthus*. It is probable that this species, so widely distributed, feeds on many of these closely allied plants in different localities.—W. SAUNDERS.

Fig. 14.

OSMIA CANADENSIS *Cresson*.—This insect, which was described by Mr. E. T. Cresson, of Philadelphia in the Pro. Ent. Soc., Phila., vol. 3, p. 23, has been found destructive to the foliage of some strawberry plants, by Mr. J. Pettit, of Grimsby, who has kindly furnished me with specimens. It was observed during the past season in the Township of Oxford. For the accompanying figure, which represents the female, I am indebted to my esteemed friend, Mr. Cresson, who very kindly made the drawing from which the cut was engraved. I am also indebted to him for the determination of the species. In the figure the insect is represented on an enlarged scale, the hair line at the side showing its natural length. In both sexes the head, thorax, and abdomen are green, and more or less densely covered with whitish down or short hairs, those on

the thorax being longest. The female is larger than the male. The male is fully described by Mr. Cresson in the volume above mentioned, to which the reader is referred.

Mr. Pettit says "the insects were taken in East Oxford, July 2nd, on a few strawberry plants in my brother's garden. The plants, perhaps nearly 100 in number, had been nearly all denuded of their leaves, and a search in the evening having failed to reveal the authors of the mischief, I examined them again in the heat of the day, and found the little culprits actively engaged in nibbling away the remaining shreds of the leaves They appeared to chew the fragments into a pulp, and carry it away, but the little time I spent in observing them was insufficient to determine anything further respecting their habits."

Doubtless the leaves so consumed were used either in the construction or lining of their nests.—W. SAUNDERS.

NOTES ON SOME BUTTERFLIES AND THEIR LARVA.—We extract the following interesting details in reference to the life history of some of our butterflies, from a letter received from Mr. W. H. Edwards, of Coalburgh, West Virginia, U. S., under date of October 12th :—W. S.

"I have in all, probably 200 eggs of *Argynnis Cybele*, some deposited on violet leaves, and some on the cloth that covered the keg in which I confined the females, with the growing plant, and I suppose half of them have given larvae. I also had quite a number of eggs of *Aphrodite*, and a few larvæ from them. I endeavored this time to avoid dryness, as the contrary state seemed to be most natural to these larvæ, and I attained this end by placing wet sand in the bottom of a glass goblet, in which sand were stuck small sprigs, or single leaves of different sorts of wild violets, all the species I could find hereabouts at this season; I also tried the pansy. The goblets I covered with damp cloths."

"The young larvæ, as soon as hatched, were transferred to these various leaves, and as none have died--although three weeks have elapsed since the first were hatched--I think they must be healthy. They are but little bigger than when hatched, but must have eaten for some days, as they were then pretty lively, but I have been unable to discover on the leaves any visible evidence of feeding. I presume they eat the surface of the leaf, not the edge. For a week past I have seen no sign of motion, but the larvae remain in the same position. In the grooves of the larger violet leaves are several, three or four in a row, and I notice that the

folded edges of leaves are sure to contain some tenants. These larvæ are about one-tenth of an inch in length, very hairy; and they have a way, when touched, of doubling themselves up, and it is easy to handle them then by a pin with a bent point. I find I can lift them off a leaf even when they are lethargic, by means of the pin, and transfer them to another leaf, when they straighten themselves out slowly and then resume their first position. As it will be impossible for me to carry them through the winter on fresh violet leaves, I shall have to place the leaves now occupied in tin boxes or some other suitable vessels, and trust to skill or good luck, hoping that by one or the other of these some of the larvæ may reach next spring alive."

"On looking over the old volumes of the CAN. ENT., I see your description of *Libythea Bachmanii*. There is a query about *Motya* in the September number of the magazine. I am sure that *Bachmannii* is the species found in the Northern States and Canada. *L. Motya* I do not know. Scudder says it is a West Indian species, and perhaps found in our Southern States. *Bachmannii* varies much, especially in the appearance of underside of secondaries, some being of a uniform brown, and others beautifully shaded with brown and fuscous or ashen. I had the good fortune to raise a brood this season from the egg, and found both the varieties spoken of, among the butterflies. I will try to find time to write a history of these larvæ for the ENTOMOLOGIST soon. I have also partially raised from the egg a brood of *Apatura celtis*, but after the second moult they seem to have undertaken their winter's sleep. The eggs of both these species are very interesting."—W. H. EDWARDS.

SIR JOHN LUBBOCK'S PET WASP.—From the *Daily Telegraph*, London, England.—One of the most curious attendants this year at the gathering of the British Association in Brighton, was a little gentleman in brown overcoat, with black and yellow nether garments, wearing a sharp sword poisoned at the tip. We are inclined to think that, next to Mr. Stanley, this visitor might be called by far the most remarkable and best worth attention among all the assembled notorieties. It was Sir John Lubbock's pet wasp; and the respect which would naturally be paid to any friend of the benevolent *savant* who has given London its new holidays, was really due to this insect on its own account. Captured in a nest of soft grey paper in the Pyrenees, the wasp was the very first of its species that had ever received an education. Sir John exhibited it to the members of the Association with just pride, as a proof of what kindness

e can effect upon the most unpromising creatures; and even er might have wondered to see it come out of the glass bottle lives, eat sugar from its master's fingers, allow him to stroke its st. back, and fly round and round his head, returning always to its home in the bottle. At first, says its distinguished educator, it was "rather too ready with its sting," but now it never thinks of unsheathing the tiny rapier at its tail; and nobody who saw the insect could doubt that its nature had been greatly changed.

A PLAGUE of butterflies is a rare occurrence. A short time ago, however, the town of Florence was invaded by a prodigious quantity of these insects. All the distance of the Long'arno between the Piazza Manin and the Barriera and in all the adjacent streets the passage was almost obstructed by an extraordinary quantity of butterflies that had swarmed in such thick clouds round the gaslights that the streets were comparatively dark. Fires were immediately lighted by order of the Municipality and by private citizens, in which the butterflies burnt their wings, so that half an hour afterwards one walked on a layer formed by the bodies of the butterflies an inch thick ! ! ! They were of a whitish colour, and some of the streets appeared as if covered with snow, at least so say the Italian papers.—*Nature.*

OUR ANNUAL REPORT.—We expect to be able to mail to each of our members a copy of the Annual Report of the Entomological Society of Ontario to the Department of Agriculture for 1872, sometime during the month of January, 1873. It will treat of insects injurious to the strawberry, grape, potato, hop, and maple. There will also be a chapter on beneficial insects, and a short history of some of our more common innoxious insects, all illustrated as far as possible by suitable figures.

PIERIS VERNALIS.—Mr. G. M. Dodge writes us from Illinois that on October 16th and 19th, 1872, he captured two male specimens of this butterfly, but that the cold weather then coming on, he saw no more. He enquires if it is not a little remarkable that this species should occur in the fall? and if the fact does not militate against the idea entertained that *vernalis* is the spring brood of *P. protodice.*—E. B. R.

THE AMERICAN ENTOMOLOGIST.—I have a few bound copies of the two volumes of this periodical, which I will send post-paid by mail upon receipt of $3.50 per volume, or $6.50 for both. Address C. V. RILEY, Room 29, Insurance Building, St. Louis, Mo.

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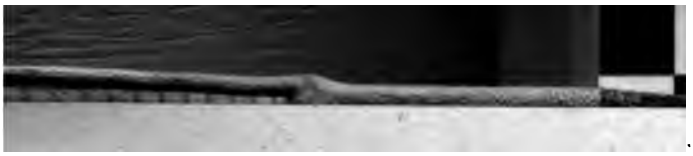

THE CANADIAN

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VOLUME V.

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The Canadian Entomologist.

VOL. V. LONDON, ONT., JANUARY, 1873. No. 1

—1873.—

It has been our custom at the commencement of a new volume to offer our hearty greetings to our friends and correspondents, to all who read the CANADIAN ENTOMOLOGIST,—to all, indeed, who take a kindly interest in the success of our journal and the welfare of our Society. This year we do so most cordially, with not a little pardonable pride, when we remember that it is for the *fifth* time. Four years and a half have elapsed since we ventured to put forth our diminutive first number that consisted merely of eight pages; with our last December number we completed our fourth volume and eight-hundredth page of Entomological matter!

A complaint has once or twice reached us lately to the effect that our publication was gradually becoming too technical, and consequently of decreasing interest to a large number of our readers, who, from various causes, are unable to become deep students of the science, but who take great delight in learning all they can respecting the economy and classification of the insects of the country. We must confess that the complaint is not unfounded, and that we have almost unconsciously drifted somewhat away from the design of the periodical. It has always been our intention and desire to meet the requirements, if possible, of two classes of readers—those, on the one hand, who are leaders in the pursuit of Entomology, and who, therefore wish to have presented to them in convenient form all discoveries of new species and other valuable scientific information that may from time to time be acquired by their fellows,—and those, on the other hand, who collect and study insects to some extent, but are not yet far advanced in the pursuit; or who merely regard insects as destructive or beneficial and therefore wish to know something about them; or, again, who take pleasure in learning all they can about these creatures without either collecting or specially studying them. To meet the particular requirements of all these various descriptions of readers would, of course, be a perfect impossibility in a periodical of such limited size as ours; at the same time we think that

something may be done for all who care for insects, without filling out pages too much with technicalities, and without losing sight of all additions to our knowledge by becoming simply "popular." To steer a suitable course between the Scylla of abstruse science on the one side, and the Charybdis of mere "popularity" on the other, is no easy task, and we fear has not yet been achieved by us. We hope, however, in the forthcoming volume to do a little better in this respect, and we look forward to a continuance of friendly aid from our correspondents in various quarters to enable us to overcome the difficulty. As a first step towards improvement we propose to present to our readers a series of illustrated papers on the common Butterflies of North America—with special reference to those found in Canada. We hope that we shall thus be enabled in time to furnish beginners in Entomology with a hand book that will enable them easily to identify any common butterfly and to ascertain where and when it may be found, what its larva feeds upon, and such other useful information as may be gathered into a short space. Owing to the difficulty there is in obtaining really satisfactory wood cuts of insects, and the time that is required for their production, we shall not be able to take up the different species of Butterflies in any systematic order, but only as we are able to obtain the necessary materials. We shall be very thankful, indeed, for assistance from our readers in this department; almost every one can help us with lists of species observed in his own neighborhood, or with notes on their time of appearance and disappearance, number of broods, larval habits, etc., etc.

The "Hints to Fruit Growers" that have been afforded by one of our Editorial Staff—Mr. Saunders—will be continued with greater frequency during the coming year; we are glad to learn from various sources that those already published have proved of much value to our horticultural readers.

As a further improvement, we should be pleased to receive correspondence from our readers upon general Entomological subjects of the day; for instance, at the present moment, upon the vexed, and we may surely say vexatious, question of nomenclature.

It will be a relief, no doubt, to the majority of our readers to learn that the reprint of Kirby's *Insects of the Northern Parts of British America* is now fast approaching completion, and will cease ere long to distress them with its constant recurrence. The whole will, when finished, be made up into a separate volume and be sold at a moderate price. We have no doubt that it will prove of much value to those who are unable

to obtain the rare and expensive original. The space thus set free we propose to occupy with translations of Guenee's Descriptions of Moths, and reprints of Drury and other old authors whose works can seldom be obtained by the student of the present day.

During the past year we have received valued contributions to our pages from a larger number of correspondents than ever before; while we beg to offer them, for ourselves and our readers, our very hearty thanks for their favors, we venture to express the hope that they will not relax in their investigations and contributions, and that many others also will feel disposed to join their ranks. Without such assistance the CANADIAN ENTOMOLOGIST would be but a sorry production, and could not long protract its existence.

Another species of support, our worthy Treasurer reminds us, is equally necessary for the maintenance and well-being of our publication—need we say that he refers to the grosser element of dollars and cents? Our rules require the payment of all subscriptions in advance at the commencement of each year; as the amount to each individual is but a single dollar, there ought to be no difficulty or delay on his part in forwarding it; the aggregate sum thus provided is, as all must be aware, a matter of great importance to us, especially as we do not receive the Legislative grant to the Society till about midsummer. The present number of the CANADIAN ENTOMOLOGIST will be sent to all subscribers on the list for 1872, who have not signified their desire to withdraw from membership with the Society; no further number, however, will be sent, unless the amount of subscription is meanwhile received. Pay your honest dues, friendly reader, and then you will not fail to have in one respect at least, what we heartily wish you in all respects, A HAPPY NEW YEAR!

ANNUAL MEETING OF THE LONDON BRANCH.

At the recent annual meeting of the London branch of the Entomological Society of Ontario, the following officers were elected:—J. WILLIAMS, President; M. L. MORGAN, Vice-President; H. P. BOCK, Secretary-Treasurer; F. OSBORNE, Curator.

An interesting and satisfactory report was presented by the Secretary-Treasurer, showing an increase of membership, and also showing the funds of the branch to be in a prosperous condition.

ON SOME OF OUR COMMON INSECTS.

PAPER NO. I.

BY W. SAUNDERS, LONDON, ONTARIO.

This paper is the first of a series in which it is proposed, by members of the editorial staff alternately, to describe some of our more common insects, to illustrate them with suitable cuts, and to make the descriptions of so plain a character that the most unscientific reader may be able readily to comprehend their meaning. Since it is one of our aims in publishing the ENTOMOLOGIST to popularize our favorite science, we shall offer no apology for introducing into our journal these readable papers, in which much material may from time to time appear, which, to the scientific reader, may look stale and uninviting. In a recent letter from a correspondent who takes some interest in "bugs," but is not deeply versed in the technichalities of the science, he complains much of the depth of the learning which has been displayed in our pages during the past, and says that although he has frequently taken a plunge into the depths of the articles, one after another, that he has rarely been able to touch bottom. It will be our aim, then, while still devoting the larger portion of our pages to scientific matter, to introduce something into each future number in which subscribers of similar scientific calibre to the gentleman already referred to, may be able, not only to touch bottom, but to wander through the shallows with ease, and we hope with some degree of pleasure.

The first insect of which we propose to treat is one of our commonest butterflies, known as the *archippus* butterfly *(Danais archippus)*. This insect is said to hybernate during the winter; it is seen on the wing usually as early as the middle of May, but it is not very common until later in the season. These first few individuals lay their eggs on the leaves of the common milkweed *(Asclepias cornuti)* and other species of *Asclepias*, also on the bitter root *(Apocynum androsæmifolium)*, during the latter part of May or the beginning of June. The eggs, when fresh laid, are white, but in two or three days they become yellow and then dull gray just before the time of hatching. They are $\frac{1}{20}$th of an inch long, conical in form,

flattened at the base. When viewed with a magnifying glass they appear very beautiful. See figure 1, where *a* represents the egg much enlarged, while at *c* it is shown of natural size and in its usual position on the underside of the leaf. On this egg there are about twenty-five raised longitudinal lines, and about the same number of cross lines between each, so that the whole appears covered with a regular and beautiful net work, as shown in the figure, which has been drawn from nature, as those also have which are to follow, by our esteemed friend, Prof. C. V. Riley, of St. Louis, Mo.

Fig. 1.

In about six or seven days the egg matures, producing a minute caterpillar one tenth of an inch long, with a large black head, and yellowish-white body, with a few black hairs on each segment, as shown at *e* and *f*, fig. 1. This larva grows very rapidly, and soon finds that its skin will bear no further stretching, when it conveniently disrobes itself and appears in garb gay and new by crawling out of its skin through a rent down the back, which takes place just at the proper time, which process is repeated three times during its growth. At *b*, fig. 1, the head and anterior segments of the larva just before its last moult is figured for the purpose of showing how the long fleshy horns with which the mature caterpillar is furnished are conveniently coiled up when buried beneath the old skin.

The full grown larva, fig. 2, is about one and three quarter inches long. Its head is yellowish with a triangular black stripe in front below, and another of a similar shape above.

Fig. 2.

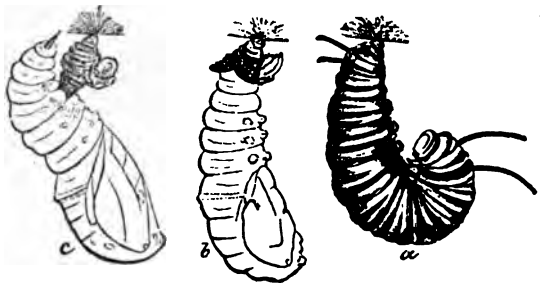
The upper surface of the body is beautifully ornamented with transverse stripes of black, yellow and white, the white covering the greater part of each segment, and having a wide black

stripe down its centre, while the yellow occupies the spaces between. On the third segment (reckoning the head as first) are two long black fleshy horns, and on the twelfth two others of a similar character, but shorter and not quite so stout.

The under side is black with a greenish flesh color between most of the segments.

The next change which comes over this caterpillar is that which transforms it to a pupa or chrysalis, a most astonishing transformation, when the voracious larva becomes for a time torpid, senseless, and almost motionless while preparing for that change when it is to appear in brilliant plumage, and gracefully float and flutter through the air, enjoying the summer's sunshine and sipping the nectar of flowers. Fig. 3 shows the larva as it appears at different periods during its transition to the state of chrysalis. At *a* it hangs suspended from a silken web, in which its hind legs are entangled and which has been previously attached by the caterpillar to the underside of a leaf, or fence rail or some other secure place of retreat, and here while hanging for about a day the larva contracts its length, and increases its bulk, especially on the anterior segments. By and by a rent takes place in the skin down the back, and the chrysalis begins to appear, and after long and persevering efforts and much wriggling the skin is worked nearly up to the hinder extremity, as shown at *b*. Now a difficulty presents itself, and a feat is to be performed to imitate which would puzzle the most daring acrobat, for without hands or feet to hold on by it has to withdraw itself from the remnants of its larva skin, and hang itself up by a black protuberance covered with a bunch of hooks, with which the chrysalis is furnished. Perilous as this undertaking seems to be, it is very seldom indeed that a failure occurs in its accomplishment. A ready explanation of the means by which this is done is given at *c*, fig. 3. The joints of the abdomen being freely movable, are first stretched against a portion of the larva skin, when, by a sudden jerk backwards, the skin is grasped and firmly held while the terminal segments are withdrawn, and

Fig. 3.



the process of suspension completed. Soon after this the chrysalis begins a series of wriggling and jerking movements to dislodge the empty larva skin, after the removal of which it remains motionless, unless disturbed, and becomes gradually harder and more contracted until it assumes the appearance represented by fig. 4.

Fig. 4.

The chrysalis is about an inch long, and of a beautiful bright green colour dotted with gold, and with a band of golden dots extending more than half way round the body above the middle; this band is shaded with black. There is a patch of black also arouud the base of the black protuberance by which it is suspended, and several dots of the same on other portions of the surface.

The insect seldom remains in chrysalis more than ten or twelve days, and towards the latter end of this period, the handsome green and gold colours begin to fade, the chrysalis growing gradually darker until the diminutive wings of the future butterfly show plainly through the semi-transparent enclosure. The escape of the imprisoned insect, now nearly ready for flight, is usually made quite early in the morning. We have several times watched for their deliverance, and have usually found it to take place soon after daybreak. A sudden crackling and slight tearing sound is heard, which arises from a splitting of the chrysalis case part way down the back, the fore legs, head and antennae are first withdrawn, and in a few moments the entire insect is liberated. At first the wings are very small, and the new born butterfly seeks at once some suitable spot where the wings may be held so as to hang down and thus facilitate the rapid growth which follows. This growth is truly amazing; we have seen the wings double their size within three minutes, and seldom more than fifteen or twenty minutes pass before they have attained their full dimensions, and, ere the sun is high in the heavens, the soft, flabby wings have dried and the butterfly is ready for flight.

The *archippus* butterfly, fig. 5, is so well known that it needs but little description, especially when so good a figure is given. The ground colour of the wings, when fresh, is a beautifully bright orange red, the veins are heavy and black, and the margins are spotted with white, the latter being more or less covered or encroached upon by the general colour. Near the middle of the hind wings there appears in the figure on one of the veins

an enlarged black streak or blotch ; this, when closely examined, is found

Fig. 5.

to be a small excrescence ; it is found only in the male, and by this peculiarity the sexes may be readily distinguished.

We have frequently seen this butterfly in great numbers on pine trees which have been infested by *aphis*, attracted there no doubt by the sweet exudations which flow from the bodies of the *aphis*, thus interfering with the rights and privileges which have always been accorded to the industrious ant. They also have the fashion of congregating at times, late in the season, in prodigious swarms consisting of tens of thousands or hundreds of thousands of individuals. In September, 1871, we met with a swarm of this character on the shore of Lake Erie. They hung in clusters everywhere on a group of trees which they completely covered ; as many as thirty-two individuals were counted on a space of the size of ones' two hands, and their total numbers we thought might safely be estimated by millions. No satisfactory reason has yet been assigned for such gatherings.

SOME REMARKS ON CHANGES IN NAMES OF CERTAIN BUTTERFLIES.

BY W. H. EDWARDS, COALBURGH, W. VA.

PAPILIO ASTERIAS. Now sought to be changed to *Polyxenes*, although from the time of Fabricius to the publication of Kirby's Catalogue (1871), no other name than *asterias* has been in use. The species has been repeatedly figured as *asterias* in these hundred years, and under this name is well known to everyone who takes the least interest in these things.

What is gained by re-naming it, I am unable to see. The first mention of *polyxenes* was in Fab. Syst. Ent., page 444, No. 10, 1775, the male being described. Fabricius in 1787, in Mant. Ins., gives the same species under the name of *asterias*, referring to Drury, vol. i, plate ii, for the type, and quoting his own *polyxenes* as synonymous.

PAPILIO GLAUCUS. Under this name Linnæus described the black female of *turnus*, and it is only within the last ten years that it has been generally known that *glaucus* was related to *turnus*. When *glaucus* is now spoken of, it at once brings to mind this striking variety, and *turnus* var. *glaucus* is a sufficient designation and answers every proper requirement. It is eminently convenient that this variety should have its own designation, and by it, it is treated of in Wallace, Walsh, Darwin, Harris, and other authors. I hope our lepidopterists will not be deluded into changing these names by any supposed obligatory rule, for the simple fact is, there is no obligatory rule in the case.

DANAIS ARCHIPPUS. Mr. Kirby (1871) gives the name of this butterfly as *erippus* Cramer. Scudder (1872) gives it as *plexippus* Linn. Scudder in 1863 gave it as *erippus* Doubleday (But. N. England.) Mr. Scudder also read a paper by the late Dr. Harris before the Boston Soc. Nat. Hist. (1859) showing that these and other names were remarkably confounded, for example: "The *berenice* of Cramer is the *erippus* of Fabricius, but not of Cramer, and it is the *gilippus* of Smith, but not of Cramer and Fabricius; the *erippus* of Cramer is the *archippus* of Fabricius and of Smith; it is also the same as the *plexippus* of Cramer, but not of Linnæus and Fabricius: the *misippus* of Fabricius is the *archippus* of Cramer, but not of Fabricius and Smith: the *erippus* of Cramer is not the *erippus* of Fabricius, and the *misippus* of Fabricius is not the *misippus* of Linnæus." And he gives a table "by which it will be seen that the nomenclature of the three North American species has become confounded with five others." In preparing the Synopsis of Butterflies of N. Am., I had at hand all the above quoted works, and could make little of this tangle; and as our northern species of *Danais* has been generally known and written of and figured as *archippus*, I deemed it advisable to adhere to that name as one resting place in a foggy sea. It is so figured in Abbot & Smith, Boisduval & Leconte, and so called in Harris' Ins. Mass. 2nd Edition, which work I believe had the assistance of Mr. Scudder in preparing for the press.

LIMENITIS URSULA. Changed to *astyanax* by Butler, 1869, and followed by Kirby and Scudder. Fabricius' Syst. Ent., 1775, named the species *astyanax*. In Ent. Syst., 1793, he re-named it *ursula* for the following reason: It then stood in the genus *Papilio*, in which also stood another *astyanax*. He therefore changed the name of the first to *ursula*, and by this latter the species has come down to this day. It is so figured by Abbott & Smith, and by Boisduval & Leconte. That Fabricius was right in so changing the name to avoid a duplicate in the same genus, is undoubted, and although the species which still retains the name *astyanax* has since been found to be the female of something else, and hence loses its original name, there seems no good reason for disturbing *ursula*. Fabricius was right in making the change, and once right always right in such a matter. Of course I do not allow or believe that *proserpina* is a variety of *ursula;* it is as near *arthemis* as *ursula* in some respects.

ON THE LARVA OF PLUSIA BALLUCA.

BY W. SAUNDERS, LONDON, ONT.

In the second volume (1863,) of the Proceedings of the Entomological Society of Philadelphia, I published a paper on some of our Lepidopterous larvæ, and among other descriptions there appeared one purporting to be that of *Plusia balluca*. By some unfortunate mishap a description of the larva of *V. interrogationis* was sent in place of the intended one of *balluca*, and the mistake was not discovered until after the number had been issued, while all trace of the original description of the larva of *balluca* was lost. I did not again meet with this larva until the summer of 1871, when a fresh description was taken on the 15th of June, as follows:—

Length, 1.20 in.; body thickest on middle and posterior segments, tapering towards the front; the body is arched or looped along the middle segments when in motion.

Head rather small, bilobed, of a shining green color, with a few whitish hairs.

Body, above, yellowish-green, streaked and spotted with white, intermixed all through with green, thus dividing the white into a series of streaks, dots and broken lines; there is also a line of greenish-white on each side, close to the undersurface. Each segment has a few tubercles of a green color, striped with white; these are small on the second, third and fourth segments, but much larger from fifth to twelfth, inclusive, and entirely wanting on the terminal segment. On each of the hinder segments, with the exception of the last three, are ten or twelve of these tubercles, which almost cover the whole surface, and from each of the tubercles throughout there arises a single whitish hair.

The under surface is of a deeper green than the upper, with a few short whitish hairs, chiefly on 5th, 6th, 7th, 8th, 11th and 12th segments. Feet green, prolegs, of which there are three pairs, green also.

This larva became a chrysalis on the 18th of June, and produced the moth on the 13th of July.

In the caterpillar state, the insect feeds on the hop, consuming the leaves, but we have never known it to occur in sufficient numbers to do much damage. The moth, (see fig. 6,) measures, when expanded, about 1¾ inches. A large portion of the upper surface of the fore-wings is covered with brilliant, metallic green scales, which are darker on the lower portion of the middle and on the tips of the wings, and much paler towards the inner angle. The wings are covered by two oblique, irregular brown lines, and parts of the upper and outer portions are tinged with purplish. The hind wings are of a brownish dusky grey, without markings. The anterior portion of the body is pale brown, marked with buff and curiously crested above, the hinder portions of the body are paler. The under surface of both front and hind wings is dull, varying in shade from pale buff to brown, one of the brown lines on the upper surface of fore wings being reproduced and extended across the hind wings.

Fig. 6.

This moth has been found in various parts of Canada, but in no instance have we heard of its being met with in any considerable numbers.

MICRO - LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Vol. 4, Page 226.

ERRATA ET CORRIGENDA.—Ante vol. 4, p. 148, for *Hermonella* read *Hermanella;* p. 149, for *Alexandriaccila* read *Alexandriœella;* p. 173, line 11, for "there" read "then;" p. 195, line 5, for "all the veins are united near the end of the cell," which is an unaccountable blunder, read 'all the veins given off from the cell arise near its end."

ANESYCHIA.

A. trifurcella, n. sp.

White; palpi annulate and tipped with dark brown or black; a longitudinal median blackish stripe on the thorax, and a spot of the same hue on each side of it; primaries white with a median wide blackish longitudinal streak beginning on the costa at the base, gradually widening to the apex, where two small white streaks or spots divide it into three short branches. Sometimes these white spots completely separate the outer branches from the median one. A row of small dark brown dots around the apex; a small spot near the dorsal margin about the basal fourth, and a larger one about the apical third of the wing. Antennae dark brown. *Alar ex.* $\frac{1}{3}$ inch. Kentucky, in July.

HYPONOMEUTA.

H. orbimaculella. Ante p. 88. Vol. 4.

This was described by me, *ante p. 42*, as *H. euonymella*, and the name changed because of its resemblance to the name of a European species, *H. evonymella.* I had not then seen the European species, nor any figure or description of it. Since then, however, I have seen the figure in Wood's *Index Entomologicus*, and think it most probable that this species is identical with it. The arrangement of the spots is identical, but in the figure of *evonymella* the fore wing is shaded with a smoky or brownish hue, while in all my specimens it is pure snow white; and the color of the hind wings in the figure is darker, and of a different shade from any of my specimens, in which the shade varies from snow white to lead color. I

incline to think that the maturity of the imago at the time of its death has something to do with the color of the hind wings, specimens killed very soon after emergence having them more slaty or lead colored than older ones.

ARGIOPE, *gen. nov.*

A. dorsimaculella.

Heribeia? incertella ante p. 44. Vol. 4.

In my former notice of this species I placed it, provisionally and with great doubt, in Stephens' genus *Heribeia*. I find, however, that either *Heribeia* Stephens is very different from the *Heribeia* of more modern English authors (which includes such small genera as *Philocnistis*, *Lyonetia*, &c.,) or I have mistaken the characters of Stephens' genus from his brief diagnosis. I had supposed it (from the characters given by Stephens and its location among his genera) to be allied closely to *Yponomeuta*. At any rate, as I cannot satisfactorily locate this species in any genus known to me, I think it best to erect a new one for it with the diagnosis given at p. 43—*Vol. 4.*

It differs from *Yponomeuta* in the colors and patterns of coloration; in having the terminal joint of the labial palpi a little larger in proportion to the others; in having the head entirely smooth; in having the primaries a *little* falcate beneath the apex, though the neuration is not materially different; in having the costal margin of the secondaries a little excised before the tip, which is pointed, and in having only a single branch (the superior furcate one) given off from the discal vein (while *Yponomeuta* has an inferior simple branch also), and in having the median furcate from the end of the cell, whilst in *Yponomeuta* it is simple.

GRACILLARIA.

G. blandella? Clem. *Proc. Ent. Soc. Phila., 1863, p. 9.*

Although Dr. Clemens' description is not strictly accurate, or rather, is not altogether intelligible, where applied to the insects now before me; and I have not seen his specimens, yet notwithstanding the close resemblance which sometimes exists between different species of this genus, I have very little doubt that my specimens belong to this species. Should it, however, prove otherwise, then I suggest for these specimens the name *G. juglandivorella* and annex the following description:

Face pale lemon yellow (or yellowish stramineous), palpi of the same hue, each joint of the maxillary palpi tipped with dark purple, the labial palpi thickly dusted with dark purple and with a wide dark purple annulus close to the tip. Vertex dark purple, with pale lemon yellow intermixed; antennae pale lemon yellow, faintly annulate with purple at the base, towards the apex purple, faintly annulate with pale lemon yellow. Thorax dark purple, with a narrow pale lemon yellow median longitudinal stripe, and a wider and more distinct one on each side above the wings, and a dark purple spot before the wings. Primaries pale lemon yellow and dark purple; the dorsal margin is dark purple from the base to near the ciliae, where the purple widens over the apical portion of the wing, except a small lemon yellow spot on the edge of the costal ciliae before the apex; costal margin from the base to the basal fourth dark purple; from the basal fourth of the costa a rather wide fascia passes obliquely backwards from the costal purple to the dorsal purple, uniting them, and thus enclosing on the base of the disc an oblong pale lemon yellow spot. Immediately behind the oblique purple fascia, the dorsal purple is excavated, and the wing is pale lemon yellow to the costa and as far back as the ciliae, with a little purple dusting or row of small purple spots along the extreme costa before the ciliae. Sometimes there is a faint golden or stramineous patch in the purple at the extreme apex, and sometimes the apex is a little dusted with golden or stramineous, Ciliae golden or stramineous, with three wide dark purple hinder marginal lines, one at the base, one in the middle, and one at the tip. (Perhaps they might be better described as dark purple, with two shining stramineous hinder marginal lines, one before their middle and one before their tip.) Posterior wings and ciliae dark purplish fuscous. Anterior and middle legs yellowish mixed with purple behind, dark purple in front except the tarsi, which are silvery white with each joint tipped with purple. Posterior legs yellowish except the apical half of the outer surface of the femora, the tips of the tibiae behind, and the tip of each tarsal joint. Thorax and upper surface of the abdomen dark purple; venter pale lemon yellow. In some lights what I have called dark purple appears violaceous or iridescent, and the stramineous portions appear golden or sulphur yellow. *Al. ex.* ⅓ in. Kentucky.

Dr. Clemens received his specimen from Virginia. I have bred it from the leaves of the Black Walnut (*Juglans nigra*). It mines the upper surface, and, when first taken, was supposed to be the mine of a *Philocnistis*, containing a pupa. It was something more than an inch long, a little crooked, very narrow, and resembled a small snail's track.

Not far from one end the mine was widened a little and the cuticle puckered, forming a small nidus like that of a *Philocnistis* pupa. Within this nidus a small larva was visible. It was white, with the head pointed before, but widened behind, and with the thoracic segments much swollen and tapering rapidly from thence to the tail. (There is a good deal of resemblance betweenthe very young larvae of *Gracillaria*, *Philocnistis* and *Lithocolletis* of the cylindrical group.) In a day or two it changed its form, becoming cylindrical and pale yellowish white, and it left the mine and went to the *under* side of the leaf, where it turned down the edge over it, and, after eating out the parenchyma, turned it down in another place, repeating this operation two or three times until it finally became a pupa under the edge last turned down. Sometimes (at least in the breeding jar) it leaves the leaf and pupates under a sheet or coverlet of white silk like *G. salicifoliella* and many other species. Which mode it follows in a state of nature I am unable to say, having never found it in the pupa state. *G. juglandiella mihi* mines the *under* surface of the leaves, but the mine is larger and more blotch like, and when it leaves the mine it goes to the *upper* side of the leaf which it curls *upwards* over itself and there passes the pupa state. I do not mean to say that this habit of going to the side of the leaf opposite the mine is universal in either species, but only so far as I have observed it in some ten specimens of each. *G. Mandella* is a very handsome species.

A BALLOON SPIDER.

BY WILLIAM COUPER, MONTREAL.

"The American Naturalist" for May, 1871, contains an interesting article on "Flying Spiders," by J. H. Emerton. The species noticed by him are, no doubt, allied to the gossamer of Europe, and the phenomenon occurs early in autumn on the Islands of the St. Lawrence.

During the month of July, 1871, while trout-fishing on a large lake near the Upper Assumption, about one hundred miles north of Montreal, my attention was drawn to an inflated transparent substance of an oblong cocoon shape, passing about fifty yards over my head. To this miniature balloon, a thread was attached, and, on tracing it downward, its architect was seen struggling on the surface of the lake. Taking up the

paddle and forcing the canoe in order to secure this curious spider, imagine my disappointment, just as I was within a yard of it, to see it swallowed by a trout. The day was fine, with just sufficient wind to waft a delicate body of this nature across the lake. My curiosity being aroused, I kept a good look out for another specimen, but no more were seen that day.

On another lake further north, and during similar weather, I was pleased to witness a number of these in their aeronautic excursions, and on a rock in the centre of the lake was fortunate in capturing a specimen of the spider. In size it is as large as the house spider. The body and legs are densely covered with stiff hair; its mandibles are long and sharp. It was extremely active, and lived about three weeks in a box after its capture. I am at a loss to account for the mode in which this spider produces the structure with the extraordinary length of attached thread, which it manages to send off in the air. The woods near the lakes are principally pines, which are moss-covered and rugged, and yet, these curious balloons are evidently constructed on trees on the margin of the lakes.

ON THE GEOGRAPHICAL DISTRIBUTION OF SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, LONDON, ENGLAND.

The following communication includes two genera of *Chalcidiæ*, *Perilampus*, and *Callimome*. *Perilampus* is known in America from Canada to Mexico. *P. hyalinus* Say, inhabits Canada; *P. cyaneus* Brulle, and *P. Entellus* Walk. are synonyms of it. Say has described two other species, *P. platigaster* and *P. triangularis;* the latter is distinguished from all other species by the dark tips of the wings. *P. Alexinus* Walk. differs from *P. platigaster* by not having a brassy tinge, by the luteous tips of the femora, and by the luteous tibiæ with a black band. The specimen of *P. Lepreos* is too much mutilated to ascertain if it agrees with *P. platigaster*. *P. hyalinus*, above mentioned, has some resemblance to the European *P. violaceus*, but has an elongated scutellum; in this character it is far exceeded by the Mexican *P. gloriosus*, which far surpasses all other known species in size and beauty. *P. gloriosus* is also peculiar in the developement of the secondary veins of the forewings

and is still more remarkable on account of the long cubitus, that vein being very short in all the other species. In Europe this genus is represented from Sweden to Italy by a few species which are generally of rare occurrence and have been observed to be parasitic on wood-feeding insects. There are two species in S. Africa, *P. maurus* and *P. discolor*; the former is wholly black; the latter is distinguished from all others by pectinated antennæ, by a bifurcate scutellum, and by a concave abdominal dorsum. *P. Hedychroides* is a small Ceylonese species, and *P. Saleius* from Australia, is the smallest species of the genus yet known.

Philomides, Haliday, is another genus of *Perilampidæ*, and is only represented by *P. paphius* Hal., a native of Cyprus. The genus *Psilogaster* Brulle, is placed by that author next to *Perilampus*.

Callimome consists of much smaller insects than those of the genera of *Chalcidiæ*, before mentioned, and some species are abundant in England. None have been reported in Canada, but the genus is doubtless there, as it occurs both to the north and the south of that region. Two species have been found near Hudson's Bay. One of them, *C. cecidomyæ* is most allied to the British *C. euchlorus*; it is parasitic on *Cecidomyia spongivora*, which forms galls on the willow. The other, *C. splendidus*, should be placed next *C. purpurascius*, with which it agrees in its stout structure. The species collected by E. Doubleday, in the United States, appear to be different from those described by Say, and a few more from the same region have been lately published by Osten Sacken. The British species are very numerous, and, as to the female, may be most obviously distinguished from each other by the comparative length of the oviduct. The chief district of the genus seems to be now N. Europe, the known species of Australia and S. America being small and scarce. Some are natives of E. Siberia or Amurland, and it is probable that the more Southern parts of Asia were the earlier habitation of the present European species. Their instinct induces them to act so that their young ones may live at the expense of gall-making insects, and there is much to observe in the mutual adaptation of the size of the gall and the length of the oviduct, and as to what species are exclusively reared in one kind of gall or are developed in several kinds, and whether differences of habitation have any effect on outward appearance. The many-chambered galls are more interesting than those with a single cell. Some ten or twelve species of *Callimome* resort to oak apples and effect lodgments for their eggs at depths proportioned to the length of their oviducts; the species which

has the longest oviduct obtains possession thereby of the grub in the central part of the gall for the maintenance of its young ones, and the latter have a longer life in the gall than the young of the short oviduct species. The different species thus dwell in different concentric circles of the gall, and observations may be made whether there is mutual agreement as to the boundary lines between their respective territories, or whether complications occur between them when they have removed the earlier inhabitants. Many other species of insects dwell in these galls, and there is also much yet to be ascertained in the domestic habits of each one, whether herbivorous or carnivorous.

MISCELLANEOUS.

GENERIC NOMENCLATURE.—Can not some method be devised to check the recently introduced habit of rehabilitating fossil genera?

To borrow a geological simile, these had their little day of life in the Eozoic period of entomological science, proved themselves unfitted to survive in the struggle for existence, and then disappeared—it was to be hoped, forever. Is it not taking a very unfair advantage of the older authors to make them responsible for genera of which they had no conception, and which certainly would have been indignantly repudiated by them?

What a change, for example, from *Papilio* of Linnæus, an overgrown genus, capable of containing whole shoals of its lesser successors to *Papilio* Linn., *teste* Scudder, applying solely to one insect, already well supplied.

If Mr. Scudder's proposed revolution in our nomenclature should be adopted, I fear that also, on the other hand, the laboratories of the "genus grinders" will resemble the mills of the gods in one respect, and in one only, namely, that of "grinding exceeding small." If every genus has a single type, then, as species differ structurally more or less, what can be more evident than that each species is in itself the type of some genus, and immortality as enduring as that of Eratostratus is within the grasp of the man who grinds out his genera with the greatest rapidity!—THEO. L. MEAD.

ATTRACTING LEPIDOPTERA.—At page 194, vol. iii, CANADIAN ENTOMOLOGIST, attention is drawn to a new French method of collecting Nocturnal Lepidoptera by means of bait.

Having purchased chemicals, &c., for the purpose of thoroughly testing it at Anticosti and Labrador, last summer, I give my experience with the hope that it may be of service. Dried apples, such as recommended, were immersed in Nitric Ether, and hung on branches of trees on the second day after my arrival on Anticosti, and I visited the baits that night and each succeeding one during my stay on the Island. Moths were flying in the vicinity, and several passed within twelve inches of the bait, but only *one* was noticed to rest on it during the season. The baits on Anticosti and Labrador were constantly visited by Diptera and ants, and these alone. My want of success discouraged me, and I resolved to add sugar to the bait, and it was only with this addition that moths were attracted. I think, therefore, that the old mode of sugaring is still the best for this country. My friend, Mr. Caulfield, tried it here last summer with a like result.

It occurs to me that a bait might be prepared to attract Diurnal Lepidoptera. I passed two months of the summer of 1871 on the Black River, about 140 miles north of Montreal. I resided in a shanty on the new Colonization Road, which follows the river through the mountains. Water in which salt pork had been par-boiled, was thrown out on the sandy loam opposite the door, and I noticed that hundreds of *Papilio turnus* frequented this spot during favorable weather, thrusting their tongues into the moistened sand when the fluid absorbed, for which they seemed to have such an extraordinary liking, rendered them semi-intoxicated.

I have seen them flying from all quarters direct for the shanty. Many of them, I believe, came from a distance of two miles at least. The spot which these butterflies visited was certainly that on which the pork water was thrown, and the effluvia resulting from this was doubtless the great source of attraction. In A. R. Wallace's "Malay Archipelago," page 124, he says that the rare *Charaxes Kadenii*, a Java swallow-tail butterfly, was caught as it was sitting with wings erect sucking up the liquid from a muddy spot by the roadside, and I have seen several of our Canadian butterflies sucking the moisture from mud on the margins of ponds made for the use of cattle.

I intend to try a few experiments in suitable places next summer on Anticosti, &c., with water in which salt pork has been par-boiled, with various other substances added, and the results will be noted for the benefit of those concerned. Cyanide of Potassium is a quick destroyer of insect life, and I recommend it for night collecting.

As it is almost impossible to keep butterflies perfect on pins while moving from place to place in wild regions, each specimen of Diurnal Lepidoptera of my next collection will be placed in a paper envelope, and my subscribers will, no doubt, receive the remainder of their specimens in good condition. Moths will be pinned, and collected chiefly by sugaring, as I believe it is the cheapest and most prolific method of procuring good specimens. I am anxious to obtain three additional subscribers for the Northern Diurnal Lepidoptera, to be collected during the season of 1873.—WILLIAM COUPER, 38 Bonaventure Street, Montreal.

QUERIES.—John R. Smith, of South Pownal, Vermont, U. S., wishes to ascertain the best locality for *P. Luna* and *Ceratocampa regalis;* also if there is any published price list of American insects.

Will any of our readers kindly give the desired information?

A NEW SOCIETY.—We are glad to learn that a new Entomological Society has been started in Brooklyn, N. Y. We cordially wish it every success.

EXCHANGE.—Mr. W. Cole, of London, Eng., is desirous to enter into correspondence with Canadian Entomologists with a view of effecting exchange of specimens. For further information address W. COLE, care of C. Browne, Esq., 5, Old Square, Lincoln's Inn, London, England.

ADVERTISEMENTS.

The undersigned would like to exchange desirable Lepidoptera from North America, Brazil, India, Europe, &c., for species of *Lycænidæ*, new to him (from any part of the world.) Californian and Arctic species especially wanted. Address H. R. MORRISON, Old Cambridge, Mass., U. S.

JOHN AKHURST, Taxidermist, No. 19, Prospect Street, Brooklyn, N. Y., keeps constantly on hand for sale, Sheet Cork for insect boxes—size, 12 x 3½ x ¼; $1.25 per dozen sheets. Felt or German Insect Paper—size, 18 x 22 x ½; 50c. per sheet. Insect pins, French make; No. 2, 4, 6, 8, 10, 12, 14, 16, 18—$1.25 per 1000. Insects for sale or exchange. Dealer in Bird Skins.

N. B.—The above prices do not include the cost of transportation.

The Canadian Entomologist.

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SOME REMARKS ON ENTOMOLOGICAL NOMENCLATURE.

BY W. H. EDWARDS, COALBURGH, W. VA.

The papers on Nomenclature, lately published in the CANADIAN ENTOMOLOGIST, have much interested me, and doubtless many others, and as the subject is one that just now, for reasons well known, appeals especially to Lepidopterists, I beg to be allowed a little of your space to give my views thereupon, and to state what I believe is a practicable remedy for the evils complained of.

I am glad that this matter of Nomenclature was brought so prominently forward by the Entomologists present at the Meeting of the American Association for 1872, and that a Committee was appointed by the Entomological section to report a series of Rules for consideration at the next Meeting.

I apprehend that hitherto very little attention has been paid to Nomenclature in this country, at any rate in Entomology, and that when startling innovations are proposed, based upon assumed Codes or systems of Rules, very few know what such Codes or Rules are, or how far they are applicable or binding, or how they came to be enacted, with many other points of like nature. As applied, they seem incomprehensible to most persons, and even to the initiated have their difficulties. In the words of Alex. Agassiz, "The laws requisite for the correct name of an animal or of a plant have become as difficult to establish as the most intricate legal question." How such a discreditable state of things has come about, it is worth while to consider.

From an early period, Entomology, quite as much as its kindred Sciences, suffered from a disagreement as to names of species, one set prevailing in England, another in France, another in Germany, and so on. The first effort to secure uniformity seems to have been made in England by the Rev. Mr. Strickland, who, after consultation with other naturalists, drew up a Code of Nomenclature for Zoologists, that was

adopted by the British Association, in 1842. (I have been unable to obtain a copy of this Code, and only know its Rules as I have found them recited in various authors. On applying to Mr. A. G. Butler, Brit. Mus., I received the following reply:—"I can get no exact information as to when and where these Rules were published. At the time, they appeared in the report on the Meeting, and separate copies were struck off and distributed. Most of our Entomologists have either made copies of them or have seen them, and a few say they have printed copies *somewhere.*"

This Code was not found to work altogether satisfactorily, and never did receive the general assent of Naturalists in their several departments. Prof. Verrill says, "The success of these Rules was but partial, even in England, for a considerable number of English authors have either ignored them or adopted them in part, often violating the most obvious and important Rules. In Çonchology, especially, the violations have been lamentably numerous."

In 1865, a Revised Code was adopted by the British Association, which Code is printed at length in the Am. Journal of Arts and Science, July 1869, with valuable notes by Prof. Verrill. In this Revision some important changes were made, with a view to curing the defects of the original Code, and of gaining a more general acceptance. It is significant

sprung up a class of authors who have devoted themselves with enthusiasm to exploring ancient works and forgotten publications of all sorts, in the hunt for the earliest recorded name to every species, by which to replace the name or names in use. The old authors had described but a few hundred species, and their descriptions were of the briefest. How brief, an average example from Linnæus will show :—"Papilio Troilus ; wings tailed, black ; fore-wings with pale marginal spots, hind wings beneath, with fulvous spots;" a description applicable, perhaps, to fifty species of *Papilio*. (This description at once misled Drury into giving the name *Troilus* to his figure of Asterias, to which it applies equally well.)

As new species were discovered, each of the earlier described having a group of close allies, many of these descriptions were no longer capable of identification, applying to numerous species as well as one. Then recourse was had to tradition, or to type specimens. The former may, or may not be trustworthy, and the latter is utterly untrustworthy unless the type agrees with the description. Dr. Staudinger says:—"It is unfortunately a fact that the acquirer of the Linnæan collection had the deplorable idea of sometimes replacing damaged specimens by fresh."

Mr. McLachlan says :—"It (this Linnæan collection,) was so maltreated by additions, destructions and misplacements of labels, as to render it a matter of regret that it now exists at all. Any evidence it now furnishes is only trustworthy when confirmed by the descriptions." Speaking of quite a modern collection, that of Mr. J. F. Stephens, Mr. Janson says :—"It not unfrequently happens that two, or in difficult genera, more species are mixed up under the same specific title."

And it is my opinion, knowing well the carelessness of collectors in the matter of labelling, some even who have described many species using no labels at all, but trusting to memory for identification of all their specimens, that a type specimen, or what was offered as such, if it disagreed essentially with the description, should be wholly rejected.

Besides the brevity of the old descriptions, many are defective from other causes. Often the two sexes received different names; often varieties were described as species ; often damaged and broken specimens were described as if fresh, the defects being cured by imagination ; often figures were made by unskilled artists, who omitted the specific characteristics, or the figures were colored so poorly as to be incapable of identification, or were copies from copies, or copies from memory, (for a curious illustration of this last, see Westwood, Trans. Lond. Ent. Soc.

1872, on Donovan's Papilios); and often descriptions were made from unreliable figures, instead of from the insect.

Now, with these and other disadvantages that might be mentioned, the authors who have undertaken to revise our Nomenclature have, each for himself, fixed on this or that description as applying to this or that insect, and there is frequent and serious disagreement between them. This will sufficiently appear by comparing the two Catalogues hereinafter mentioned, which, as to the names of British butterflies alone, that one might suppose had been settled long ago, differ as to the correct specific name to the extent of one-seventh of the whole number, as has been stated by Mr. W. A. Lewis, in his paper on Synonymic Lists. Lond. 1872.*

To complicate the case still further, there is a disagreement as to the date at which names shall be held to have first begun. Specific names did not originate with Linnæus, but that naturalist was the author of the binomial system of Nomenclature, and enunciated it in 1751. This was after his earlier works had been published, and even he did not fully apply the system till several years later. He re-described the known species of insects, using sometimes the names of his predecessors, but often re-naming, and very frequently changed a name given by himself in his earlier editions.

in 1871, adopts the *10th edition* of the same work (1758), and says distinctly :—"*Every name given before 1758 loses its right.*" Others go back to various earlier dates. If the earliest Linnæan edition comes to be claimed as having a prior right over those that followed, as symptoms indicate, then there will be a sweeping away of landmarks, that will make the lesser floods hitherto experienced seem as nothing.

The result of all these efforts at stability, for that is the avowed object of the advocates of rigid priority of date, is extreme confusion,* instead of the agreement hoped for when the Code of the British Association was adopted, and students of one branch of Entomology at least are at a loss to know where the Nomenclature stands to-day, and are very certain that under the present order of things there will not be a name familiar to them that 20 or 50 years hence will not be supplanted under the claims of priority.

The Code of the British Association not only has not been adopted in detail by the British naturalists, who might be supposed to have given their assent to it, but it has not been adopted in other countries.† It is not the law of France nor of Germany. In the latter country, in 1858, a Code of Nomenclature was adopted by the Dresden Congress, in which the Rule on the subject of priority more sensibly meets the requirements

* Prof. Verrill, in his comment on Rule 2, says:—"Disregard of this important and essential law (viz., *fixing the 12th edition as the starting point,*) has brought into Conchology, *and some other branches of Zoology*, an almost incredible amount of confusion."

† "Notwithstanding the Rules sanctioned by the authority of the Brit. Ass'n, it would not seem that any perceptible improvement has taken place."—*G. R. Crotch, Cur. Ent., 1872*

Mr. Kirby has revised, &c., "in accordance with a series of Rules *selected from those issued* by the Brit. Ass'n for 1865."—*Wallace.*

Dr. Thorell "refers to the old Brit. Ass'n Rules with general approval, but differs from them in some important points."—*Ibid.*

Dr. Standinger lays down eight rules that vary from those of the Brit. Ass'n or from Kirby and Thorell in several particulars. And Gemminger and Harold's Cat. Coleopt. differs in the Rules applied from all the others. *See Wallace.* As to French authors, the following extract of a letter to me from a distinguished English Entomologist will show how heterodox is their position :—"The chief confusion in generic Nomenclature is owing to the French, who consistently ignore or alter every thing done in other countries, on purpose to force their own names on the world in place of others."

of the case. "*The principle of preserving the oldest of the names given to the same insect is not absolute; the choice between them, following the greater or less degree of convenience, remains free.*"

Until quite lately, although there was a general feeling among Lepidopterists that the hunt for new names was getting to be a nuisance that demanded abatement, there seems to have been no active opposition to it, till the publication of the Catalogues of Staudinger and Kirby, and, in this country, of Scudder's Revision. The changes announced in these works amount to a revolution of much of the existing Nomenclature. In the Revision the names of American species have been changed largely, and of genera almost altogether. For example: of the Butterflies found in New England, out of 28 hitherto recognized genera (omitting the *Hesperidæ*) Mr. Scudder has left but three untouched; of five others he has retained the name, but restricted the genus; but of nineteen he has changed the names altogether, displacing well-known names by others purporting to have been found in ancient authors, and mostly in Hubner. And from the twenty-eight genera have now proceeded fifty-one. Whilst of the *Hesperidæ* he has made forty-five genera for one hundred and thirty-eight species, besides giving a horrid array of barbaric family and tribal names, remnants of systems ages ago deservedly exploded.

Mr. Kirby's "Revision has the effect of abolishing scores of old and familiar names (generic) and replacing them by others altogether new to the majority of Lepidopterists" *Wallace*; and Mr. Crotch, by following out his mode of determining typical species, "shows us that Mr. Kirby is wrong in the names of twenty-seven genera," defined before Hubner, and in a letter he says: "I stopped abruptly at 1816, as the question of Hubner's *Verzeichness* beat me," to which bewilderment we should be grateful, for the assimilative powers of that author are fearful.

The trouble caused by the strict application of Rule 1 to specific names becomes intensified when applied to generic names. It might be supposed in the hunt for the former, that if the several authors now at variance could be got to interpret the ancient descriptions by the same illumination, and could agree upon a starting point, the ultimate name of each species would some day be reached. It might require a long period, but it would seem possible. Not so with genera. Even when the final stage of disintegration was reached, and each species stood in a genus by itself, there would be a never-ending contest as to whether such genus should bear

the stamp of Fabricius, or Latreille, or Hubner, and each successive "resurrectionist," as these exhumers of dry bones are irreverently called, would but glory in upsetting the platforms of his predecessors, and would prove to a nicety that they and their systems were all wrong. Now, it is a matter for admiration that, notwithstanding the imposing names attached to these generic creations, every one of them is the result of the labor of Brown, Smith or Jones, alive and industriously working, and that the ancient worthies, so honorably preferred, lived and died in happy ignorance of the progeny after ages would attribute to them.

Now, it is insisted by those who rigidly adhere to the application of the priority theory to generic names that the original name given to a genus must never be lost, no matter what changes are made with the genus, although to retain such name may be to attribute to its original author exactly what he did not mean, and perhaps never would have sanctioned.

Rule 4th says:—"A generic name, when once established, should never be cancelled in any subsequent subdivision of the group, but retained, in a restricted sense, for one of the constituent portions." And Rule 5th:—"The generic name should always be retained for that portion of the original genus which was considered typical by its author."

That is to say, Papilio of Linnæus embraced what is now divided into very many genera, and the name Papilio must somewhere be retained. What particular species Linnæus would have chosen for the type of the genus, had he foreseen its future disintegration, is not known, and in the absence of such knowledge, authors now would differ in selecting the typical species; and unless there is agreement on that, it is plain that nothing but discord can follow. Mr. Kirby says, following the Rules:—"In subdividing a genus, the original name should be restricted to the typical sections if this can be ascertained." I have asked of an eminent Ornithologist what would be done in such case in his science, and he replied as follows:—"It is our custom to take the *first name mentioned* by an author as the type of his genus, unless another be especially claimed; and, if this genus be subsequently subdivided, to insist that the original name must be retained for the *first species of the original list*, unless there are very grave reasons to the contrary. I notice, in the 10th edition of Linnæus, the first Papilio is Priamus, from Amboyna. I should, therefore, be inclined to maintain that the name Papilio should be retained for that first mentioned species, whatever else might befall the group. This being premised, the author engaged in overhauling a group has the right

to select any other species of the original section as the type of his new genus." Mr. Crotch says (Cist. Ent., 1872) "No genus can be considered defined until its type is indicated," but when this is not done by the original author, "I am not inclined to cut the knot by taking *the first species*, but to trace the genus historically until it has a type given to it;" and "Cuvier (1799) gives precision to the old genera by characterizing them and indicating their types."

Let us apply these *dicta* to Vanessa Antiopa as metamorphosed into Papilio Antiopa by Mr. Scudder. He says:—"The generic name Papilio was applied by Linnæus to all the butterflies at the foundation of the binomial system of Nomenclature. Fabricius, in his later works, restricted it to the Nymphales and *Papilionides*. Schrank was the next author to restrict the name, limiting it, in 1801, to most of the Nymphales."

By Rule 5, or by Mr. Kirby's Rule, the original name having to be restricted to the typical section, Schrank should have left it with some part of the Papilionides of Fabricius, for I suppose no one can doubt that the swallow-tailed butterflies were the typical section of Linnæus (Equites), even though his typical species may be in question. Had he bound himself by the ornithological dictum, he would also have restricted the name to the *Papilionides*, *Priamus* being the typical species.

By that of Mr. Crotch he would still have been restricted to the *Papilionides*, making *P. Machaon* the type, because Cuvier (in 1799) made this species the type of the genus *Papilio* (and so it is recognized to-day and I hope will be for all future time.)

But, says Mr. Scudder, "If the laws of priority have any force or meaning, I do not see how we can refuse to acknowledge the *claims* of Schrank. I select, accordingly, from among the species grouped under Papilio by Linnæus, Fabricius and Schrank, one of *the best known* European butterflies as most suitable for the type of the genus." And by this curious process, one of the *best known species* being selected as the type, we get the astonishing creation Papilio Antiopa.—(Scud.) And this is equivalent to enunciating another *dictum*, being the fourth on this head, by which the *best known* species of a genus is to be the typical. Moreover, such exceedingly minute definition is given to the new genus that it would appear to be impossible that a second species could ever be embraced within it.*

* I notice that Mr. Scudder speaks of the "insufficiency of their generic descriptions" being "the reproach of Lepidopterists." Mr. Wallace, on the other hand,

Now, here are four modes of determining the typical species of a genus, propounded by as many authors, and there may be others for aught I know to the contrary, all with the view of simplifying these sciences, under the operation of Rule 1. Is it strange that "an incredible amount of confusion" is the result?

Linnæus placed under Papilio the princes of the order, and no matter what restrictions may have been made hitherto, these hundred years, Papilio has always had a magnificent following, increasing in splendor as the years went on. And now we are told, in 1872, that, in order to save the *claims* of the hitherto unappreciated Schrank, who published his speculations in 1801, Papilio is to be ejected from his rich possessions, and made to share the rest of his unlucky days with the dingy Vanessan to whom hard fate and Mr. Scudder has driven him. No more the superb creature we have read of, with "glistering burganet," and "shinie wings as silver bright,"—"refreshing his sprights," in "gay gardins," "pasturing on the pleasures," &c.; but, like Clarion, "reduced to lowest wretchedness," his good times all over, he flits about in slums and nasty lanes—and there we leave him.

In the explanatory remarks to Rule 4, it is said:—"It is an act of justice to the original author that his generic name should never be lost sight of." By Mr. Scudder's new creation the name Papilio is so nearly lost sight of that it might as well disappear altogether. It is certainly no compliment to Linnæus to retain it.

And this brings up the whole question of the obligation of naturalists to adopt whatever system any one may propose. Clearly enough, the right of ignoring changes made in Nomenclature is recognized even by the most determined advocates of strict priority, when applied to their contemporaries. A genus is set up, and no one follows it. It happens constantly, and it seems to me that in this matter one's contemporaries are the proper judges of one's work, and that no reversal of their judgment may rightfully be looked for from posterity, and therefore the writings

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assert is that the definitions of a Westwood, or of a Doubleday, are "careful and elaborate." I was much struck on reading these words in Cope's Origin of Genera, page 6:—"The reader will often find introduced into diagnoses of genera characters which indicate nothing of this sort;" and these, "adjacent genera of the same series differ from each other *but by a single character*." From which it may be inferred that inordinate length of generic description is not commendable, and is not properly attainable.

of authors whose systems were rejected in their own day, and whose generic creations were ignored not only by contemporaries, but for generations afterwards, cannot properly be appealed to. If there was injustice done to them it is too late to remedy it, and justice at this late day means injustice to those in present possession, and whose title often has the strength of nearly a century's undisputed possession. We cannot judge of the circumstances that influenced the contemporaries of such authors, and with the views prevailing at the time, their judgment was right. Therefore, when Schrank, and Hubner and others, are sought to be reinstated, and a host of generic names set aside, the later injustice is worse than the first,—if there was any first, and of that we have no knowledge. Otherwise, fifty years hence a system or a genus proposed by an author of to-day, though rejected by every naturalist living, for defects that appeal to the sense of each one of them, may be reinstated in spite of such contemporary judgment.

It has become more and more the practice, for twenty years past, to ignore all genera created since Hubner, and to replace subsequent names by names taken from that author, who published a Catalogue of Lepidoptera, in which nearly every species stands by itself, in a division that, whatever it may be called, is not generic. Of course it is easy to apply one of his names to every genus that can be now created. By his contemporaries, and for a generation after his works were published, his fanciful divisions and fanciful names were rejected, and it is only of late years that some authors have discovered that in his works is a mine of wealth.

But on this head it is sufficient to give the words of an Entomologist whose authority is second to none. I quote from the annual Address (1871) to the Lond. Ent. Soc., by Mr. Alfred R. Wallace, President of the Society, and I quote at some length, as it seems to me desirable that American Lepidopterists should be made aware that Hubner's claims are not yet everywhere acknowledged:—"By far the most important and most numerous alterations are caused by adopting the names of an author who has long been purposely ignored as an authority for genera both by English and Continental Lepidopterists. I of course allude to Hubner."

"Such old names as Chionobas, Agraulis, Eresia, Godartia, Adolias, Polyommatus, Leptalis, Terias, Callidryas, Thestias, Anthocaris, with many more, are changed for others to be found in no other work than Hubner's obsolete and useless Catalogue. Yet this wholesale change

does not seem to be warranted by the Rules of the British Association. Rule 12th says:—"A name which has never been clearly defined in some published work, should be changed for the earliest name by which the object shall have been so defined." And in the explanatory remarks it is said, "Definition properly implies a distinct exposition of essential characters, *and in all cases we conceive this to be indispensable.*"

Now this Rule merely embodied the feeling and practice of naturalists, and it had been acted on for thirty years, before it had been formally enunciated, in this very case of Hubner, whose work had been systematically set aside as an authority by most European Entomologists, because it was felt that his so-called genera were mere guesses founded on *facies* alone,—happy guesses, no doubt, sometimes—but as frequently wrong as right, and wholly without such definition as was held, even in his own day, to be required to constitute a new genus. Boisduval expressly states this, and his non-recognition of Hubner's genera has been followed in almost all the great systematic works which have since been published. If we take Hubner's first four genera and the characters he gives them, we shall be able to judge of the reasons for this course. They are as follows:—

Hymenitis,.....upper wings half banded.
Ithomia,..... " " one-banded.
Oleria..... " " twice-banded
Thyridia,.....both wings banded.

Such a mode of defining genera, though it has the merit of being simple and symmetrical, is undoubtedly superficial, and it can only be by the purest accident that a group so characterized can correspond in extent to any real genus. * * * In Mr. Kirby's own work, we find Hubner's condemnation in almost every page, in the utter want of agreement between his groups and modern genera. The modern restricted genus Heliconius, for instance, contains species belonging to seven Hubnerian genera; Pieris comprises five, and Thecla twelve of these hap-hazard groups; while, in other cases, the species comprising Hubner's groups are divided among several unrelated modern genera. * * * * The names sought to be reinstated, rank as mere catalogue names for want of proper definition, and should therefore never be quoted. * * * Even as a matter of justice it may be maintained that we should recognize the careful and elaborate definitions of a Doubleday or Westwood, rather than the childish guesses of a Hubner. * * * The proper course to be taken is to rein-

state every name which of late years has been made to give place to one of Hubner's, and further, to treat the *Verzeichniss bekannter Schmetterlinge* as a mere Catalogue, which can never be quoted as an authority for genera."

Now with regard to the remedy for the evil complained of. There have been various suggestions of Rules by foreign authors, many of which would meet the assent of most Entomologists, and it is easy to select from these authors both Rules and arguments for their adoption. I will call attention to so many of these suggested Rules as seem to me to meet the difficulty of the case, and to others, which might properly form part of a code, and will give short extracts illustrating them.

I mention them for the purpose of exciting discussion as to their fitness for the end in view, and that Lepidopterists may know what is the opinion of students in other branches of Entomology besides their own:—

1 There must be intelligible description and publication in case of a species, or a recognizable figure. In case of a genus there must be a definition giving the essential characters.—*From Dr. Thorell's European Spiders, quoted in Wallace's Address, before cited.*

2. In determining the priority of specific names, notice should be taken only of those works in which the Linnæan binomial nomenclature is exclusively and consistently employed.—*Thorell.*

Note—"The binomial system of nomenclature was fully and distinctly propounded by Linnæus in the *Philosophia Botanica*, published in 1751, and there can be no reason whatever why authors who adopted and systematically applied it should be set aside, because Linnæus himself did not apply it to the whole animal and vegetable kingdoms till 1758."—*Thorell.*

3. The same date should apply to generic as to specific names, both being characteristic of the binomial nomenclature, and it being impossible if we go back earlier, to determine what are to be considered as truly generic names.—*Ibid.*

4. Between two specific names in use, the prior right shall belong to the first named. *But no name in use shall give way to an obsolete or rejected name, even though the latter be of prior date.—Wallace's Address, p. 67.*

Note.—"The idea of justice to the namer or describer of a species is sometimes appealed to, but the law of priority is founded on no such

expressed idea, but rather on the universal practice of mankind, which always upholds stability of nomenclature, and requires cogent reasons of beauty or convenience to sanction its alteration. * * * * * *

"The proper Rule to adopt (instead of Rule 1 of Brit. Ass'n.) would have been *unchangeability of names in use*, rather than priority of date, which latter rule ought only to have been brought in to decide on the claims of two or more names in use, not to retain obsolete names never in use, or long ago rejected.—*Ibid.*

"What we want for the sake of knowledge is stability and uniformity of nomenclature, not an upsetting of it by the substitution of old, forgotten and very doubtful names, published in works without, or with very little scientific merit."—*Dr. Schaum, on Nomenclature of British Carabidæ, Ent. Ann., 1860.*

"The rule of priority in Nomenclature, I hold to be a good rule within its proper limits; it is not an unmixed good; and priority, like every other hobby-horse, may be ridden too hard. When the rule is strained beyond the reason for the rule, it becomes a nuisance,—nay more, it produces intolerable evil; but when reasonably applied, it produces more convenience than inconvenience. I accept it, therefore, as a rule for convenience, and nothing more, a rule adopted for the benefit of science, not for the glorification of name givers."—*J. W. Dunning, Ent. Mo. Mag., vol. 8, 215.*

"In systematic nomenclature the object is to register titles, not to gratify pride, and the names of authors are appended for convenience, not fame; the question of justice or injustice has no place here."—*Scudder, Am. Jo. Arts and Sci., 1872.*

"Both sides agree that the accord of Entomologists is the ultimate desideratum. I hold that the law of priority is not that the oldest name of an insect is invariably the right one, but that in cases of dispute, the prior name is to be preferred, and in such cases only; and that any attempt to subvert accord cannot be done under the law of priority, but we must make a new law—the law of *antiquity* say. * * * * In such event, every insect capable of identification must henceforth carry the name under which it was first called—no matter by whom—no matter the language. The American fire-fly must bear its Indian appellation—the 'Palmer-worm' and the 'Canker-worm' must have their 'prior' names restored; we must carry the law back without limit—even to chaos itself."—*T. H. Briggs, Ent. Mo. Mag. vol. 8, p. 93.*

"Nobody but a fool or a madman would try to persuade the modern New Yorkers to call their city New Amsterdam, or the English to have their letters addressed to Londinium, because these were the old original names. And yet, what men of the world would never dream of doing, certain scientific men are doing every day."—*Walsh, Am. Ent., 1872.*

5. The name placed after a genus shall be that of the author who established the genus in the sense in which it is actually used.—Dr. Sharp, in Nature, Feb., 1872.

Note.—"Carabus of Linnæus included all the insects now comprised in the family Carabidæ, at present divided into several hundreds of genera. To write, therefore, Carabus, Linn., when we mean something else, may be usual, but is not desirable."—*Dr. Sharp, ibid.*

I do not deny to any author the right to establish new genera. Quite the contrary. But I would insist on these genera standing on their own merits, and claim for the Entomological world the right to accept them or not, as they choose. If any one thinks it worth while to break up Papilio, for instance, let him do so at his pleasure, but do not let him apply to the severed parts names taken from Hubner or other ancient author, in order to give these brand-new creations a smack of age, and so get the advantage of another author who may honestly put his name to his own work

stamped with such an authority as will suffice to make it pass current."—*Explan. Rem. to Rule 1.*

"The name originally given, even though it may be inferior in point of elegance or expressiveness to those subsequently proposed, ought, as a general principle, to be permanently retained."—*Ibid.*

9. The same generic name may be employed in Botany, but not in Zoology.

I have heard the objection to the application of the above Rules, that Entomologists have no right to separate themselves from other naturalists, and make a special Code for their own sole guidance. To this I would reply, why not? If it is found impossible to enact a series of Rules that will meet the requirements of the several branches of Natural Science, and the experience of thirty years shows that the thing is impracticable, why should not each branch adopt Rules to suit its own case? If Botany may be excluded from the operations of a Code, why not Entomology? It is very certain that in other branches than Entomology there is widespread dissatisfaction, and I believe an effort for reform in any direction will be met by general approval. At all events, as the dissatisfaction felt on this side the Atlantic has found expression, and a set of Rules is to be prepared as aforesaid, by a Committee of experienced Entomologists, it may be left to them to estimate the force of this and any other objection, and to report accordingly.

But Entomology is peculiar in one respect, and if there were no other reason, this alone would make it imperative that its votaries should resist strenuously unnecessary changes in Nomenclature, even if, by so doing, they should separate themselves from other naturalists. This is the only branch of Natural History that is becoming thoroughly popular through organized effort. Not to speak of Europe, the Governments of the United States, and many of the individual States, and Canada, employ professional Entomologists, who make frequent Reports that are printed by authority, and widely disseminated with the view of rendering the people intelligently acquainted with their native insects. Several Magazines have been published, which are exclusively devoted to the same subject, and the numerous agricultural weeklies or monthlies set apart a portion of their space for Entomology. Professedly, the object is to give information upon insects injurious to vegetation, but that includes, in one relation or other, every insect. The expensive treatise of Dr. Harris was published by the State of Massachusetts, and is everywhere a received authority. Packard's

Guide to the Study of Insects, has passed through three large editions, in as many years, and is rapidly becoming the text book used in our schools and colleges.

The result is that a vast degree of attention is concentrated upon Entomology, a hundred fold, I venture to say, more than upon Botany or Geology, and a thousand-fold more than upon Ornithology or Mammalogy. In these branches, therefore, a disturbance of names would affect scarcely any but special students, and if they do not care to resist innovations, it is not our concern. But, from the nature of the case, in Entomology, the advantage gained by disseminating information depends wholly upon the precision with which the objects treated of can be identified, and precision can result only from the use of a common Nomenclature. If one Treatise dilates upon the habits of an insect by one name, and the next Report under another, and anybody may shift about the names, specific and generic, at will, nothing can result but incomprehensibility and disgust. What man reading the history of Papilio Asterias, figured with all its preparatory stages, and colored to the life, in Harris, and the larva of which species he recognises as one of the pests of his garden, will comprehend what the Annual Report of his State Agricultural Society for 1873 shall say upon Amaryssus Polyxenes? or, his old acquaintance, familiar from boyhood, that he has been instructed to call Papilio Turnus, when he shall read about Euphœades Glaucus? Mr. Wallace well says, "Intelligible language is wholly founded on stability of Nomenclature, and we should soon cease to be able to understand each other's speech, if the practice of altering all names we thought we could improve upon became general."

I hope, therefore, that the Entomological section of the American Association, at its next Meeting, will adopt a new or amended Code, having in mind the exigencies of their own science only, and that full discussion and interchange of opinion having meantime been had, such Code will express the views of the great majority of the Entomologists of this continent. If the Rules are sensible, they will recommend themselves to the Entomologists of other countries, and in time secure general adoption.

ON SOME OF OUR COMMON INSECTS.

II. CABBAGE BUTTERFLIES.

BY THE EDITOR.

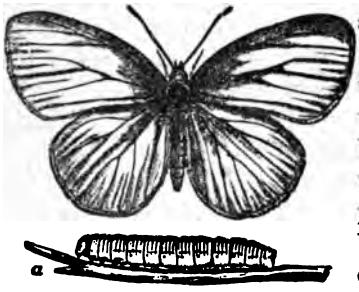
In pursuance of our plan of laying before our readers, from time to time, illustrated descriptions of the common insects of this country, we propose to begin in this number of our journal some account of the Butterflies belonging to the genus *Pieris*—familiarly known in their larval state as "Cabbage-Worms." As stated by our coadjutor, Mr. Saunders, in the first paper of this series (C. E., v., page 4), we do not profess to bring out any new facts or information of interest and value to the experienced Entomologist, but we wish to afford to our less scientific readers plain descriptions, with illustrations, of our more common insects, in order that any one beginning to collect and observe may be able to identify and learn something about what he meets with. Such being our object, we shall not hesitate to make use of all available information, whether derived from our own or extraneous sources, and shall not pretend to be especially original in our descriptions or remarks.

The genus *Pieris* is represented in Canada by but three species (*Oleracea*, *Rapæ* and *Protodice*), all of them white butterflies of moderate size, with more or less conspicuous black markings. The first-mentioned species, the Pot-herb Butterfly (*P. Oleracea*, Harris), is our native representative of the genus, being found all over the northern portion of this continent, from Nova Scotia and Maine in the East to the District of Algoma and even Manitoba in the North-West. It has been occasionally observed south of Lake Ontario, but very rarely as low down as Pennsylvania; at Ottawa, Collingwood, and other northern localities in Ontario, it is generally quite abundant every year, but it is seldom observed in any great numbers at Toronto or other places in the same latitude. When prevalent, it is usually to be seen on the wing from May to September, there being at least two broods in the year.

The *Oleracea* Butterfly (Fig. 7), may be at once distinguished from all other Canadian species by its almost pure white wings, destitute of spots or other markings on the upper surface; towards the tip and also next the

body the forewings are slightly discoloured with dusky scales. On the under surface the wings are sometimes of a yellowish hue, with the veins broadly marked with black or dark green; sometimes they are entirely white, with the veins merely faintly outlined in black; between these two extremes many gradations of shade may be observed. The pure white specimens found in the North West were supposed at one time to be a distinct species, and were described by Kirby under the name of the "Chaste Butterfly" (*P. Casta*); there is no doubt now, however, that these are merely varieties of the same species. The legs and body of the insect are black; its wings expand to a breadth of about two inches, but there is considerable variation in the size of individuals.

Fig. 7.



The butterfly, about the end of May or beginning of June, and again towards the close of summer, may be seen hovering over the food-plants of its larvæ, preparing to deposit its eggs. These are pear-shaped, or oval, of a yellow-green colour, and measure about one-twentieth of an inch in length, and a third of this amount in diameter; they are ribbed longitudinally with about fifteen sharp-edged lines. The parent deposits them singly, and rarely more than one on a leaf, on the under side of the leaves of the cabbage, turnip, radish, mustard and other plants of the order *Cruciferæ*. They are hatched in about a week or ten days.

The young larva is pale green, cylindrical in shape, and covered with short, whitish hairs. In order to escape from the egg it makes an opening with its jaws and then eats the shell until the aperture is large enough to admit of its easy egress; it subsequently devours the greater part of the shell that remains. At first the new-born caterpillar is less than one-twelfth of an inch in length, but it grows rapidly, until it attains its full size, about an inch and a quarter, in the brief space of a fortnight. The mature larva (Fig. 7, *a*) is pale green in colour, with numerous darker dots and a dark line along the back; it closely resembles the ribs of the leaf upon which it feeds.

When mature, the caterpillar forsakes its food plant and crawls away to some secluded spot, such as the under side of a stone or board, or a crevice in a fence or wall; there it spins a knot of silk to which it fastens its hindermost pair of feet; then it proceeds to form a loop of silk which

it dexterously fashions into a girth around the middle, and thus supported finally turns into a chrysalis. This is pale green or whitish, finely and regularly speckled with black, and in shape much resembles that of *P. rapæ*, of which an illustration will be hereafter given. In summer the chrysalis state lasts only a week or ten days, but in the case of the autumn brood the insect remains in this condition all winter and only comes forth as a Butterfly in the April or May following.

REVIEWS.

CONTRIBUTIONS TO ENTOMOLOGY FROM THE STATE OF NEW YORK.—Two works of value on the life history of various insects taken in the neighbouring State of New York, are before us; both of them emanate from official sources, and singularly enough, both appeared but a few months ago, though the Reports to which they belong have reference to the year 1869. The first to which we would draw attention is entitled "ENTOMOLOGICAL CONTRIBUTIONS," by Mr. J. A. Lintner.* It contains a remarkably elaborate description of the metamorphoses and whole life history of the handsome but rare moth *Hemileuca Maia*, Drury, occupying nearly twenty pages, accompanied by a lithographed plate of egg, chrysalis and imago, and constituting an excellent monograph of the species. This is followed by interesting observations upon various stages in the life of the butterflies *Melitæa Phæton*, Fab., *M. Nycteis*, Doubl., and *Pieris Oleracea*, Harris. The author then describes, with illustrations, three new species of *Nisoniades*, named *Icelus*, *Lucilius* and *Ausonius*; and a new Sphinx, *Eliema pineum*, which will probably be found in Canada, if it be not already in some of our collections under the name of *E. Harrisii*—a closely allied species. A list of forty species of Sphingidæ, another of over a hundred butterflies, and calendars of butterflies and moths, complete the author's observations. To these he has appended a very useful list, with references to volume and page, of all the North American moths, some 600 in number, described in Guenee's *Species General des Lepidopteres*. The volume is concluded by a translation from the German of a paper by Dr. Speyer on *Cucullia intermedia*, Spey., and *C. lucifuga*, W. V., to which Mr. Lintner has prefixed some notes on the larvæ. We have given a full account of the contents of this volume in order that the student may know where to look for very valuable contributions to our

* *Entomological Contributions*, by J. A. Lintner. From the twenty-third Annual Report of the New York State Cabinet of Natural History, for the year 1869. 8vo., pp. 90.

knowledge of the species referred to. We trust that Mr. Lintner will not relax in his efforts, but will continue to afford us year by year a complete record of his most pains-taking and accurate observations.

The other work, to which we have alluded above, is DR. FITCH'S THIRTEENTH REPORT as Entomologist of the State Agricultural Society of New York.† It opens with a long account of the synonymy and natural history of the Bean Aphis (*A. rumicis*, Linn.,) followed by descriptive notices of the Black-lined Plant-bug (*Phytocoris lineatus*, Fab.,) the Lilac Measure-worm (*Priocycla armataria*, H. Sch.,) and a new species of the latter genus, *P. Johnsonaria*, Fitch. The remainder of the Report is occupied by a very long and minute account of the two Cabbage Butterflies (*Pieris oleracea* and *P. rapæ*), covering some six and thirty pages. The diffuseness of these notices leads one to wish that the talented author would extend his observations to some other department of economic Entomology, and afford us, as he is so well able, concise and accurate accounts of species that are not yet familiarly known. While upon this subject we cannot forbear complaining of the excessive difficulty there appears to be in obtaining Dr. Fitch's Reports; we have tried in vain to obtain his 10th, 11th and 12th, and only succeeded as a special favour in getting the one we have just noticed. We are sure that Entomologists would esteem it as a great boon were they permitted to purchase these Reports separate from the volumes of Agricultural Transactions, at some reasonable price. The Naturalist's Agency at Salem would, we should think, be an excellent and convenient depository for them.

The volume of 'Transactions' contains also an admirable account of "The Grasses and their Culture," by the Hon. J. Stanton Gould, illustrated by upwards of 70 beautiful lithographed plates.

FOR SALE.—A fine collection of named Shells, mostly marine—comprising about 1800 species, with numerous varieties and many rare shells. Also about 200 species of Corals and Radiates. The specimens are all in the finest order, having been selected with a view to their perfection and beauty. The collection embraces about 6000 specimens. For further information address D. W. FERGUSON, Corner of Hester and Elizabeth Streets, New York.

† Thirteenth Report on the Noxious, Beneficial and other Insects of the State of New York. By Asa Fitch, M. D. Transactions of the New York State Agricultural Society for the year 1869. Albany.

The Canadian Entomologist.

VOL. V. LONDON, ONT., MARCH, 1873. No. 3

ON SOME OF OUR COMMON INSECTS.

III. CABBAGE BUTTERFLIES.

BY THE EDITOR.

The next species of *Pieris* on our list—the Rape Butterfly (*P. rapæ*, Linn.,) though an European insect, is rapidly becoming one of our commonest and most destructive species, especially in the Eastern portion of the Dominion. The history of its arrival near Quebec in some ocean steamship, its discovery by Mr. Couper in 1859, its capture in abundance at Quebec by Mr. Bowles, in 1863, and its subsequent rapid spread in all directions is probably well known to all our readers. It is needless, then, for us to dwell upon it here; we may merely state further that it had reached the city of New York in 1869, Halifax, N. S., in 1871, and last year it had come as far west as Belleville and Trenton, Ont. We fully expect to see it at Port Hope this year!

The Rape Butterfly, like the preceding species, is white, with a black dash at the tip of the forewings, a black spot on the front margin of the hind wings, and in the male (Fig. 8) *one* black spot in the middle of the forewings, but in the female (Fig. 9) *two*. The under surface of the forewings, in both sexes, is marked by *two* spots, corresponding to those on the upper surface in the female; in other respects the wings are much alike on both sides, except that beneath there is a tint of yellow at base and tip. Occasionally *male* specimens are found of a bright yellow colour, like our common Sulphur-yellow Butterfly (*Colias philodice*); to

Fig. 8.

this variety, which does not occur at all in Europe, Mr. Scudder has given the name of *Novangliae*, from the first observed specimens having been found in the New England States. Dr. Fitch gives it as his opinion that this colour is produced by seclusion from light (13th Report, p. 559), but we should think it much more probably caused by peculiarity of food. Mr. Caulfield, of Montreal, (C. E., iv., p. 203,) is stated indeed to have found the yellow colour displayed when the larvae had been fed upon mignonette. We must await fuller observations, however, before we can feel justified in adopting any particular theory upon the subject.

Fig. 9.

The larva (Fig. 10, *a*) of this Butterfly is, when full grown, of a pale green colour, finely dotted with black, with a yellowish dorsal stripe, and a series of small yellow spots forming a stripe along each side; its length is about an inch and a quarter. It feeds, like *P. oleracea*, upon various species of cruciferous plants, especially upon the cabbage, to which it is most destructive. In this case it bores down, when feeding, into the very heart of the plant and thus renders the vegetable quite unfit for food. It forms its chrysalis (Fig. 10, *b*) in the same kinds of situations and in a similar manner to the preceding species. In this state it remains, in summer, for from a week to a fortnight, but in the autumn it continues as a pupa until the following spring. There are at least two, perhaps three, broods in the year.

Fig. 10.

The ravages of this insect in Northern America are beginning to be somewhat checked by a parasite (*Pteromalus puparum*, Linn.); it belongs to the ichneumon family, and is a four-winged fly, about one-eighth of an inch long, with a golden-hued body and a bright green head.

The remaining species of *Pieris* found in Canada—the Southern Cabbage Butterfly (*Pieris protodice*, Boisd.)—is quite a rarity with us, though oftentimes very abundant in the western and more southern States. Last August we found it to be the commonest butterfly about Chicago and through the States of Illinois and Iowa. Like the other two species, it is white with black markings; the accompanying illustrations so well represent the butterfly

that we need not occupy our space with any special description. (Fig. 11, with the comparatively few black spots, represents the male. Fig. 12, the female, with its much more numerous and conspicuous spots and markings.)

Fig. 11.

The chrysalis (Fig. 13, *b*) is over half an inch in length, of a light bluish-gray color, more or less profusely speckled with black, with the projecting portions tinted with pale yellow or flesh color, and marked with large black dots. The caterpillar (Fig. 13, *a*) varies in colour from deep to pale bluish and green; it has four longitudinal yellow stripes, and is thickly covered with black dots. As in the other species there are two broods in the year, and the winter is passed in the pupa state. In the Southern States it is a very injurious insect, but here it is too rare to be more than an interesting curiosity.

Fig. 12.

Fig. 13.

Another species of *Pieris* (*P. frigida*, Scudder) has been taken in Labrador and on the Island of Anticosti, but it is not likely ever to spread much, or to be ranked amongst 'common insects.'

ON THE GEOGRAPHICAL DISTRIBUTION OF SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, LONDON, ENGLAND.

ISOSOMA.—So much has been lately written about this genus that it may be dismissed with a few words. The *Eurytomidae*, to which it belongs, were considered by Nees to be in a debatable state between the

Chalcidiae, and the *Cynips* tribe, and though they are now fixed with the *Chalcidiae*, there is still matter for argument as to their maintenance by animal life, or by vegetable life, or as to how they are divided between these two means of existence. Nees mentions his discovery of a gall-making *Eurytoma*, and Girand announces his ascertaining the vegetable food of *Isosoma*, a fact afterwards observed by Moncreaff, but this genus has more importance in the U. States, where Harris, Fitch and others have been witnesses of its ravages on corn. But the most interesting part of its history is in Canada where a species occurs in grape seeds, and is remarkable not only on account of the singularity of its abode, but also by the contrariety of the sexes, one of them representing the carnivorous *Eurytoma*, and the other the herbivorous *Isosoma*, and thus one species figuratively combines the diminishers of vegetation and the controllers of such diminution. *Isosoma* is destitute of the metallic hue which is the especial ornament of its tribe, but possesses a compact and elegant form, a finely sculptured thorax, and a highly polished abdomen. It occurs in Australia, in Amurland, and probably in all the chief parts of the earth.

PTEROMALUS.—This genus is the last of the Canadian *Chalcidiae*, and thereby indicates what a multitude of discoveries in this tribe are yet to be made in Canada. It inhabits all parts of the earth, and the British species are exceedingly numerous. *P. puparum* is the type of the genus and has been long known in Europe. The chrysalis of a butterfly affords food and lodging for its young; it was found formerly near Hudson's Bay, and its appearance in the U. States has been lately a source of gratification, and it can hardly fail of being shortly recognized in Canada, having now the means of making itself known.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Vol. 5, Page15.

G. eupatoriella. Ante p. 9. Vol. 4.

The former notice of this species was very brief and imperfect, having, as there stated, been made from a single specimen which had been untimely nipped from its pupa case. Since then I have bred and captured other specimens. It may be *G. Venustella* Clem., *Proc. Acad. Nat. Sci., 1860.*

p. 92, and re-described by Dr. Clemens, *Proc. Ent. Soc. Phila., 1863, p. 216.* It does not agree accurately with either of Dr. Clemens' descriptions, but it seems to be a somewhat variable species, though some of the most striking marks in my three specimens are not mentioned by Dr. Clemens. I therefore retain the above name for the present, at least, as Dr. Clemens gives no measurement for his species, and was unacquainted with its food plant. In the following description I have noted the points in which my specimens differ among themselves and from Dr. Clemens description.

Maxillary palpi and basal joint of the labial palpi dark brown; terminal joint white, with a dark brown annulus before the middle. (In one specimen the labial palpi are entirely white, except the annulus. Dr. Clemens' first description says: "white, with a blackish spot near the middle and one near the tip." His second says: "Second joint fuscous at its end, third with a broad fuscous ring.") Antennae brown; head white; thorax white, narrowly margined near the apex with dark brown, and a dark brown line beginning on the head and extending to the apex of the thorax. (Dr. Clemens does not mention this line nor the dark margins.) Primaries dark grayish brown. A white streak along the dorsal margin from the base to about the middle, where it is confluent with the first dorsal oblique streak. (In one specimen it does not attain the oblique streak. This oblique streak is not mentioned by Clemens, who simply says "the basal portion of the inner margin is white.") A small white dorsal streak at the beginning of the ciliae (not mentioned by Clemens.) A short white costal streak in the basal portion of the wing; another about the middle, extending to or crossing the fold and pointing towards the second dorsal streak. (Dr. Clemens calls this second costal streak a fascia extending obliquely across the wings and sometimes constricted or partially interrupted near the dorsal margin. If sufficiently interrupted, this would make my second dorsal streak.) Two narrow white fasciae in the apical part of the wing, the last one not oblique. (Dr. Clemens calls these costal streaks extended to the middle.) All these streaks are dark margined internally, and the two last named are continued into the dorsal ciliae (a mark not mentioned by Clemens.) A fifth white short costal streak at the apex (not mentioned by Clemens, unless this is what he means by "Ciliae—at the tip of the wings white, touched with black at the ends.") Ciliae of the general hue, with a dark brown hinder marginal line beyond their middle. Anterior legs dark brown, with yel-

lowish-white tarsi; middle pair like the anterior, except that there is a white annulation near the middle of the femora; another at its articulation with the tibiae, and another near the base of the tibiae; posterior legs whitish, annulate with dark brown. (Dr. Clemens says nothing about the markings of the legs and tarsi, but in his classification of his species by the color of the tibiae, he places *Venustella* in the section "without white tibiae.") *Al. ex.* ¼ inch.

The larva may be found in the leaves of *Eupatorium ageratoides* from July to October, but is rather rare. The mine is at first a short narrow white line, but ends in a large tentiform mine. It is on the under surface, and the larva frequently leaves one mine to form another. The maxillary palpi are a *little* larger in this insect than in *Parectopa robiniella* Clem.; and I have not examined the neuration of this species, but I think it is evident at a glance that they are congeneric. And I do not see how, with a species like this before him, Dr. Clemens could have placed *robiniella* in a separate genus. In fresh specimens of *robiniella* the head is *not* roughened. At p. 7, vol. 4, *ante*, I have suggested that *Parectopa* Clem. is simply Zeller's section of *Gracillaria* with eight marginal veinlets in the primaries. Zeller's section agrees nearly with Herrick-Schaffer's genus, *Euspilapteryx*. And a glance at a figure of *Gracillaria (Euspilapteryx) amogattella*, or *G. (Eupilapteryx) phasianipinella*, as figured by Stainton, *Nat. Hist. Tin.*, or the former in Woods' *Index Entomologicus*, settles the position of *Parectopa* so far as the *pattern* of coloration can affect it.

Many of the species of this genus, when very young, make linear mines. The mines of *G. plantaginisella* and *G. eupatoriella* are short, crooked lines, ending in the large tentiform blotches heretofore described. That of *G. salicifoliella* is a narrow white line, sometimes nearly straight and with lateral branches on the underside of Willow leaves; when it leaves this mine it again enters the underside, but passes immediately through to the upper surface, where it makes the large blotch mine. The statement at p. 20 *ante*, that it makes but a single mine, is incorrect, as it commonly makes two or three. The young larva is flattened, resembling somewhat a flat *Lithocolletis* larva. *G. purpuriella* sometimes pupates under a web, as stated *ante p. 28*, but usually in its cone. The complete cone sometimes occupies an entire leaf; the apex of the leaf is bent over, so that the left edge touches the right one, to which it is fastened; then the leaf is rolled spirally to the base, and the tip is used to close one end and the base the other, so that the whole leaf is utilized. Many of the

mines, however, are by no means so perfect. Possibly the form of the mine may be useful as indicating the affinities of the species. *G. desmodifoliella* Clem. at first makes a narrow linear short mine on the underside of the leaf, ending in a small tent mine, which is indistinguishable from that of *Lithocolletis desmodiella* Clem., in the same leaves; afterwards it leaves the mine and rolls the leaf downwards from the tip. The mines of *G. (Parectopa) robiniella* and *G. (Parectopa) lespedesæfoliella* Clem. resemble somewhat the mines of the older larvae of *G. salicifoliella*. The larval habits of the other American species are unknown, except *G. juglandisnigracella*, which makes at first a short linear mine ending in a white blotch on the under surface; at this stage it is indistinguishable from the young mines of some species of *Lithocolletis;* when it leaves the mine it feeds, and then pupates under the edge of the leaf turned up. I have seen no account of the European *G. juglandiella*. The Black Walnut *(Juglans nigra)* is naturalized in Europe. If it is the food plant of *juglandiella*, then *juglandisnigracella* or *blandella* may be the same insect.

ORNIX.

The species of this genus may be distinguished from those of *Gracillaria* by the roughened head, the somewhat broader primaries and the duller colors.

Many of the species resemble each other very closely, so that, as Mr. Stainton says, the specific characters are to be sought for in the ciliae.

"In early life the larvae are leaf miners and make mines on the *under* surface of leaves, difficult to distinguish from those of the genus *Lithocolletis*. Towards maturity, however, they abandon their mines and feed under a portion of a leaf turned *down* from its edge, which is bound closely with silk. When they are full fed a small portion of the edge of the leaf is turned over, and the larva weaves its cocoon within the cone thus made."—Clemens' *Proc. Ent. Soc. Phila., 1861. p.* The italics in this quotation are mine. Mr. Stainton gives substantially the same account of their habits. And I believe the species described below as *O. inusitatumella* is the only known species which has a different habit.

O. inusitatumella. N. sp.?

Dark iron gray, almost brown. Labial palpi whitish, with a dark brownish gray annulus on the third joint before the tip. Head dirty grayish mixed with brown. Antennae gray brown, faintly annulate with

white. Thorax and primaries dark iron gray, or brownish; primaries pale whitish gray along the dorsal margin, dusted with brown. A narrow, brown streak from the fold, which widens into three small spots, once near the base, once towards the middle, and once behind the middle. Seven (or eight?) indistinct pale costal streaks, the first before the middle, the last close to the apex; those in the apical part of the wing are longer than those about the middle, and extend nearly across the wing, and all are internally dark margined. A white spot at the extreme apex, very small, and followed by a minute dark brown dot, behind which is an indistinct brown hinder marginal line. Ciliae of the general hue. *Alar ex.* nearly ⅓ inch.

At the bottom of *p. 116, v. 3, ante*, I have mentioned a mine on the upper surface of the leaves of Haw trees, which resembles that of *Lithocolletis Virginiella* on the upper surface of Ostrya leaves; and which I then supposed to be the mine of an undescribed *Lithocolletis*. (As will be hereafter explained, there is no such species as *L. Virginiella*, and the supposed mine of that species proved to be the mine of *L. tritenœanella*. (But of that hereafter.) The mine on the *upper* surface of the Haw leaves proves to be that of the *Ornix* above described. This mine is white, with the frass scattered, and much of it attached to the upper cuticle. It is large and nearly circular, and when completed the leaf is folded *upwards. The larva never leaves the mine, but pupates in it, in a brownish-red cocoon attached to the upper cuticle.* I have never seen it on any leaves except those of *Crataegus tomentosa*, and never on those, except in one small piece of woodland containing about ten acres, near Covington, Kentucky. There they are very abundant, and I have found multitudes of them containing larvae and pupae, and empty ones with the pupa case projecting through the upper cuticle, from May to November. *I have never met with any other Ornix on the leaves of C. tomentosa.* It is a very difficult species to rear, as out of at least one hundred mines that I have gathered containing the larvae and pupae, I have succeeded in rearing but two specimens of the imago.

Dr. Clemens states that his *O. crataegifoliella* has the labial palpi whitish; and does not mention the annulus; and he says that the fore-wings have a few whitish streaks *in the apical part of the wing.* His description is scarcely sufficient to enable one to determine a species among those which resemble each other so closely as do many species of this genus. But if he had mentioned the annulus on the palpi, and had

not confined the whitish streaks exclusively to the apical part of the wing, I should have considered *captured* specimens of this species as specimens of his species, which he says also feeds on *C. tomentosa*. But then the habits of his species are those of the genus generally—that is, it leaves the mine and pupates under the turned *down* edge of the leaf.

Nor can there be any suspicion that my first surmise about the mine was correct, viz., that it is a *Lithocolletis* mine, from which I have failed to rear the imago; whilst I have bred an *Ornix*, which was unobserved in another mine on the same leaves. For in one of the instances in which I bred it, I placed, one evening, a single Haw leaf in a wide-mouthed vial, containing nothing else. The leaf was carefully examined, and contained nothing but the mine and pupa of this species. The next morning the *Ornix* had emerged, and its pupa skin was projecting from the mine.

I have, therefore, described it as a new species, notwithstanding its close resemblance to *O. Crataegifoliella*, which Dr. Clemens says feeds upon the same leaves, but which I have never found on or in them.

For the purpose of comparison with the preceding species, and with the one described afterwards (*O. prunivorella*), I here quote Dr. Clemens' description of his species.

O. Crataegifoliella, Clem., *Proc. Ent. Soc. Phila., Nov., 1861*, (p. 94 of Mr. Stainton's edition.)

"Labial palpi whitish. Head dark brown and gray intermixed. Antennae dark brown, faintly annulate with whitish. Forewings dark brown, with a purplish hue. Along the inner margin, from the base to the anal angle, whitish dusted with dark brownish. In the fold at the base is a dark brown streak, and a small blotch of the same hue beyond the middle, nearly reaching to the inner margin. Toward the tip are a few whitish costal streaks, and at the apex a small round dark brown spot in a whitish patch, with a circular dark brown apical line behind it; ciliae blackish gray. Hind wings blackish gray; ciliae rather paler. Abdomen blackish, tipped with dull yellow."

"The larva mines the leaves of *Crataegus tomentosa* (black thorn) in September, and becomes a pupa early in October, weaving a reddish-brown cocoon in a turned down edge of the leaf. The pupa case is thrust from the end of the cocoon at maturity, the imago appearing early in May. There is doubtless a summer brood, but I have not sought for it. The head of the larva is brown; the body greenish-white, with the dorsum

reddish-brown." This description of the larva suits the larvæ of a great many species.

O. prunivorella. N. sp.

Dark steel gray, almost brown. Labial palpi white, each joint tipped externally with dark steel gray. Antennae of the general hue, faintly annulate with whitish. Thorax and primaries dark steel gray, the primaries with about nine faint whitish costal streaks, the first near the base and the last at the apex, becoming gradually longer from the base to the apex, all faintly dark margined internally, the last three or four nearly perpendicular to the costal margin, crossing the wing *and uniting near the dorsal margin*, where they are very narrow and indistinct. A small black apical spot, behind which are three dark hinder marginal lines in the ciliae, the first of which is at their base, and becomes furcate in the dorsal ciliae, the second is at the middle, and the third at the apex of the ciliae. *Al. ex.*, ½ inch. Kentucky.

The larva mines the leaves of Apple trees (*Malus*) and Wild Cherry trees (*Prunus serotina*), making a large tentiform mine on the under surface, which can only be distinguished from that of *Lithocolletis crataegella* Clem., in the same leaves, by its larger size. It is at first a short crooked line, which ends in the large tentiform mine. It leaves the mine to pupate under the edge of the leaf turned down.

Lithocolletis crataegella, Tischeria malifoliella, Aspadisca splendoriferella, and so many larvae of larger moths feed indifferently on the leaves of *Crataegus, Prunus* and *Malus*, that I at first, when I bred this insect from Apple and Wild Cherry leaves, was inclined to suppose it to be *O. crataegifoliella* Clem., but a slight inspection shows it to be different, and I have never found it feeding on Haw leaves. Among other things which distinguish it from *O. crataegifoliella* and *O. inusitatumella* the posterior margin of the wings is not whitish, and it has three hinder marginal lines in the ciliae. It may be found in all stages through the summer and fall.

PERSONAL.—We are pleased to learn that Mr. Aug. R. Grote, one of our esteemed contributors, well known for his many valuable papers on Lepidoptera, has removed from Demopolis, Alabama, to Buffalo, N. Y., where he has undertaken active work in connection with the Society of Natural Science.

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 5.

BY E. T. CRESSON,

Continued from Vol. 4, Page 231.

Genus MICRODUS, Nees.

MICRODUS IMITATUS. *N. sp.*

♀.—Sanguineous, shining; head, antennæ, prothorax, surroundings of scutellum, pleura beneath, four anterior legs, including their coxæ, posterior trochanters and their tibiæ and tarsi, black; sides of mesothorax tinged with blackish; metathorax coarsely punctured above with four longitudinal carinæ, the two central ones approximate, flanks less coarsely punctured; wings uniformly fuliginous, with the usual hyaline angular streak beneath stigma; abdomen long, narrow, polished, with a purplish reflection; ovipositor longer than body. Length .37 inch.

Massachusetts. More slender than *sanctus*, with the mesothorax, scutellum and sides of pleura sanguineous; the metathorax is differently sculptured and the posterior tibiæ are black.

MICRODUS SIMILLIMUS. *N. sp.*

♂ ♀.—Pale sanguineous or fulvo-ferruginous; head, antennæ, the thorax, except metathorax and four anterior legs including coxæ, black; metathorax opaque, scabrous; wings fuliginous; tips of posterior tibiae and tarsi more or less fuscous; abdomen shining, suture between first and second segments very deeply impressed. Length .22–.27 inch.

New Jersey; Pennsylvania; Illinois. Much smaller than *sanctus*, which it closely resembles, and from which it is at once distinguished by the posterior trochanters not being black.

MICRODUS CALCARATUS. *N. sp.*

♀—Sanguineous; head, antennæ, the thorax, except metathorax, four anterior legs, posterior trochanters and their tibiae and tarsi, black; four anterior knees, anterior tarsi except claws, intermediate tarsi except tips of joints, all the tibial spurs and apical joint of posterior tarsi, white or whitish; metathorax shining above, with carinae forming an elongate central area; wings fuliginous as usual; abdomen shining, second

segment with two finely crenulated, transverse lines; ovipositor as long as body. Length .25 inch.

Delaware. Allied to *sanctus*, but much smaller, with the tibial spurs and four anterior tarsi white.

MICRODUS DIVISUS. *N. sp.*

♂.—Sanguineous; head, antennae, pleura, metathorax, post-scutellum, four anterior legs, including coxae, posterior coxae beneath, their trochanters, tips of their femora, their tibiae and tarsi, black; metathorax roughly scabrous; wings fuliginous; abdomen depressed, smooth and polished, a broad, rather deep fovea on each side at base of second segment. Length .34 inch.

Illinois. Differs from *medius*, to which it is closely allied, by the color of the legs; the metathorax is more roughly sculptured, and the clear blotch beneath the stigma more obscure, while in *medius* it is very conspicuous.

MICRODUS AGILIS. *N. sp.*

♀.—Small, slender, black; tip of clypeus, labrum, mandibles and palpi yellowish; thorax shining, metathorax opaque, scabrous; wings hyaline, faintly dusky, iridescent; legs pale sanguineous, posterior tibiae yellowish, their tips, a narrow annulus near base, and their tarsi, blackish; three basal segments of abdomen pale sanguineous, remainder black, shining; ovipositor as long as body. Length .25 inch.

Massachusetts.

MICRODUS DISCOLOR. *N. sp.*

♂ ♀.—Small, yellow-ferruginous; antennæ entirely black; space between summit of eyes and two large spots on occiput, fuscous; most of prothorax, sutures of mesothorax, space around scutellum, sides of pleura and metathorax above, all more or less fuscous; metathorax transversely rugulose above; scutellum sometimes blackish, and the spots on occiput sometimes indistinct; wings pale fuscous, areolet very minute; legs honey yellow, most of tarsi, tips of four posterior tibiæ, tips of posterior femora and an annulus near base of their tibiae, blackish; abdomen opaque, shining beyond third segment, which is more or less fuscous; one specimen has the vertex, occiput and thorax entirely, the posterior tibiae except broad median annulus, and the first, apex of the second, and the thir-

segments of abdomen black. The ♂ varies from entirely ferruginous, except antennae and posterior tibiae, to almost entirely black. Length .14 inch.

Illinois. A very variable species.

MICRODUS PALLENS. *N. sp.*

♀.—Honey-yellow, shining; tips of mandibles and antennae black, scape reddish beneath; metathorax roughened, opaque, pubescent; wings pale fuscous, areolet sub-triangular; intermediate tarsi dusky, tips of posterior tibiae and their tarsi black; abdomen polished. Length .22 inch.

Illinois. Allied to *fulvescens*, Cress., with clear spot beneath stigma much less distinct.

MICRODUS LATICINCTUS. *N. sp.*

♂.—Small, black, shining; mandibles and palpi pale; metathorax scabrous; tegulae pale honey-yellow; wings hyaline, iridescent: stigma blackish; legs honey-yellow, posterior coxae dusky at base beneath, their tibiae yellow, broadly black at tips, their tarsi fuscous; abdomen shining black, first segment longitudinally striated, second yellowish, remainder polished. Length .20 inch.

Missouri. (C. V. Riley.)

MICRODUS CINCTUS. *N. sp.*

♂ ♀.—Small, black, shining; tip of clypeus, mandibles and palpi pale-yellowish; antennæ pale testaceous, more or less dusky toward tips, scape piceous; metathorax opaque, finely scabrous; tegulae pale; wings hyaline, iridescent, faintly dusky; legs honey-yellow, tips of posterior femora above black, their tibiae yellow, black at tips, with a narrow black annulus near base, their tarsi fuscous; coxae of ♀ generally entirely black, of ♂ entirely honey-yellow; abdomen black, polished, first segment opaque, second segment pale honey-yellow. Length .17 inch.

Illinois. Smaller than *laticinctus*, from which it is at once distinguished by the first abdominal segment not being striated.

MICRODUS ANNULIPES. *N. sp.*

♀.—Small, black, shining; clypeus, mandibles and palpi more or less pale-yellowish; metathorax rugose, somewhat shining; tegulae honey-yellow; wings hyaline, iridescent, stigma and nervures pale brown; legs

honey-yellow, anterior pair pale, posterior tibiae white, tips and a spot near base black, their tarsi black, white at base; abdomen polished black, second and sometimes base of third segment honey-yellow. Length .16–.18 inch.

Massachusetts; Pennsylvania; Illinois. Easily recognized by the white posterior tibiae annulated with black. It is closely allied to the two preceding species.

MICRODUS EARINOIDES. *N. sp.*

♀.—Small, slender, shining black; mouth pale piceous, palpi whitish; metathorax rugose, sub-opaque; tegulae honey-yellow; wings hyaline, iridescent; legs honey-yellow, posterior tarsi whitish, apex and spot near base black, their tarsi black, whitish at extreme base: abdomen black, depressed, polished, basal sutures of second and third segments sometimes pale. Length .15 inch.

Massachusetts; Illinois. Resembles *Earinus limitaris* in miniature.

Genus EARINUS, Wesm.

EARINUS LIMITARIS.

Bassus limitarsis, Say, Bost. Jour. Nat. Hist., i., p. 250.

♂ ♀.—Black, shining, with a short pale silky pile on face, pleura and metathorax; mesothorax not trilobate, feebly punctured; metathorax rounded, shining, disk with a narrow longitudinal groove; tegulae whitish; wings hyaline, iridescent, costal nerve and stigma black, nervures fuscous, areolet quadrate; legs honey-yellow, posterior tibiae pale, apex broadly and a narrow annulus near base black, their tarsi entirely black; abdomen narrow, depressed, polished, second segment with an oblique groove on each side behind which is a round swelling; sheaths of ovipositor thick, fringed with short dense black pubescence. Length .25–.35 inch.

Canada; Mass.; Penn.; Virginia; Illinois. Common.

CANONS OF SYSTEMATIC NOMENCLATURE FOR THE HIGHER GROUPS.

BY SAMUEL H. SCUDDER.

[From the American Journal of Science and Arts, Vol. III, May, 1872.]

Several years ago, the American Association for the Advancement of Science appointed a committee to reconsider the canons of biological nomenclature, and to report whether, with the growth of science, they required any additions or alterations. No report has yet been made, nor, so far as we are aware, is any likely to be presented, until the subject is again brought prominently forward and new instructions given. Professor A. E. Verrill has since republished * the Revised Rules of Zoological Nomenclature adopted by the British Association for the Advancement of Science in 1865, and has accompanied them by a few apt comments; in England, Mr. W. F. Kirby, in a paper read before the Linnean Society of London, has called attention to the extensive changes which a strict adherence to the laws of priority would cause in the generic nomenclature of butterflies; and quite recently has put the same into practice in his catalogue of these insects.

But hitherto very little has been said concerning the special application of definite rules to groups higher than genera, and it is to this division of the subject that we desire to call attention.

In attempting to legislate upon this branch of zoological nomenclature, two principles must be kept in view: *first*, so far as possible, the canons already in general acceptance for generic nomenclature should be applied to all the monomial groups. Unity of principle lies at the foundation of acceptable legislation; *second*, retrospective laws should be avoided.

One difficulty meets us at the outset,—what some are pleased to term the unstable nature of the higher groups, but which we should prefer to call the disagreement of naturalists as to the limits and value of these groups; yet as this diversity of view is a nearly equal hindrance to any code of rules, it needs only to be mentioned in passing.

Endeavoring to keep in mind the principles above enunciated, and as the simplest means of presenting our views, the following outline of a code is suggested for the consideration of zoologists.

* This Journal, July, 1869.

Canons.—1. The name originally given by the founder of a group should be permanently retained, to the exclusion of all subsequent synonyms.

This rule, recognizing the law of priority, which lies at the foundation of all systematic nomenclature, is the same as the first and prime rule of the code accepted by the British Association, with the exception of certain references made exclusively to species; and, since this canon meets universal acceptance, there is no need of discussing it, aside from the following limitations.

1. This law of priority should not extend to works published before 1758.

The same reasons for such a limitation do not exist in the present instance as in the case of specific nomenclature; but similar objections can be made to an earlier limitation. Only three reasonable courses are open to the naturalist: to accept (*a*) no limitation whatever, in which case "our zoological studies would be frittered away amid the refinements of classical learning;" (*b*) the limitation here formulated, in which case all our systematic nomenclature takes its common origin in the tenth edition of Linne's Systema Naturæ;* or (*c*) to apply the laws of nomenclature to each kind of group (sub-family, family, class, etc.), from the time when such group was first brought into use—which would engender such con-

With the exception of certain verbal modifications, this law is identical with the sixth section of the British Association rules, where it is applied to genera only.

5. In any subsequent alterations of the limits of a group, its name should never be cancelled; but should be retained either in a restricted or an enlarged sense.

The necessity for such a limitation is obvious; otherwise a different name would (or, could) be given by every author who differed from preceding ones in his ideas of the precise limitation of any group in question. This indeed has already been done, and, if continued, will create lamentable confusion; but this limitation should itself be subject to one exception, which may be formulated thus:

6. But any assemblage so defined by an author as harshly to violate the groupings of nature (as known to naturalists of his time), should be cancelled.

Such a rule would prevent the injury which might accrue to science by too close an application of the preceding law. The parenthetical limitation seems, however, to be necessary.

II. Changes in the name of one group should not affect the names of other groups.

This follows as a corollary of the first canon, but it has been not infrequently violated, and it is easy to perceive the cause. The nomenclature of higher groups, notably of families and subfamilies, has, to a considerable degree, been founded upon generic names, with the addition of special collective endings to the root (see recommendation 1). Now, when a generic name which has formed the basis of a family designation has been found to be pre-occupied, it has been thought necessary by some to recast the nomenclature of the higher group. But why? After a name has been long applied to a group, it ceases to have any intrinsic meaning and is simply associated with the group itself, recalling it without reference to any particular member of the same. It certainly would be agreeable if we had a nomenclature in which each group should by the very association of ideas recall its members; but since that is utterly impossible, and we have to deal with a mass of synonyms already tangled and intricate, our problem is—how best to make our way out of the difficulty without a continual wrangling over names and entailing endless disputes upon future generations.

To this canon no exception whatever should be made; for it would be difficult to draw the line anywhere and gain general consent. Anyone who considers the subject, will see that one apparently reasonable exception will lead to another scarcely less desirable, until the whole value and force of the proposed canon is destroyed.

III. The mere enumeration of its members, when known, is a sufficient definition of the limits of a group, and gives it an unquestionable claim to recognition.

Although it is certainly *most* desirable that every name proposed for a group should, when first propounded (or shortly after), be accompanied by a full description of its essential characters, it is evident that no one acquainted with the subject of which an author treats can fail to understand his meaning if he defines his groups by mere enumeration of their members. If, for instance, he designates the known genera to be embraced in a proposed family, he actually defines his group much better than he could do by a specification of its characters, since we have probably not yet been favored with any description of a natural family which gives everything which is characteristic and omits all that is not.

Recommendations.—1. "That assemblages of genera, termed families, should be uniformly named by adding the termination -idæ to the name of the earliest known or most typically characterized genus in them; and that their subdivision, termed subfamilies, should be similarly constructed with the termination -inæ."

This recommendation, formulated by the committee of the British Association, is deprived of a great part of its value by the disagreement of naturalists as to the nature of family and subfamily groups,—assemblages of very diverse natures having received this designation at the hands of different writers; indeed, up to the issue of Professor Agassiz's Essay on Classification, no one had ever attempted to give definite shape to current opinions upon the subject; and it will be long before we shall see a general concurrence in either the views put forward in that work, or in any modification of them. Such being the case, it is evident that the recommendation cannot have the force of a law, nor be allowed retrospective action. Otherwise these rules, or any other reasonable ones (however generally they may be accepted), are powerless to assign to any higher natural group a fixed and unalterable name; but the group in question would receive a different name from different authors, according as they considered it a subfamily or an assemblage of still another nature.

2. All monomial collective names should be derived from the Greek, and have a plural form.

3. Only the surname of the author who first proposed a group need follow its name, whether the group be used in its original or in a modified sense; but when it is desirable to indicate at the same time its recognized altered limits, the surname of the writer who first proposed the accepted circumscription may follow in a parenthesis.

In systematic nomenclature, the object is to register titles, not to gratify pride, and the names of authors are appended for convenience, not fame; the question of justice or injustice has no place here; and yet the above recommendation ought to be satisfactory to those who view this matter in a different light.

NOTES FROM THE EAST.

PIERIS RAPÆ.—The yellow variety of this butterfly occurs here every summer, from the commencement until the end of the season; what I have seen of them were of a delicate sulphur yellow. I netted all that I met with, but never found a yellow female on the wing. In July, 1870, I had a pot of mignonette growing on my window-sill, and observed a *white* female *Rapæ* laying eggs on it. I reared seven or eight of the caterpillars, feeding them on mignonette, and they all assumed the pupa state; after the butterflies had emerged, a friend unfortunately opened the box and some of them escaped before I had seen them. When I examined the box there were five yellow females remaining in it. They had the dark markings very strongly produced, as the later broods generally have; not knowing at the time the scarceness of the yellow females, I did not preserve them, and I have not seen one since. I believe, with the exception of one reared by Mr. Bowles at Quebec, it is the only instance on record. Last spring I found some chrysalids of *rapæ* containing parasites, but did not succeed in breeding them, as the change from the cold of the open air to the warmth of the house killed them. Last summer *rapæ* was very abundant here, and now the chrysalids may be seen in great numbers suspended to the fences about the city. The parasite has increased wonderfully during last season, for nearly all the chrysalids that I have seen this year are infested with them. I do not think that more than one in fifty has escaped their attacks.—F. B. CAULFIELD, Montreal, P. Q.

MACROBASIS FABRICII.—This beetle was very numerous here last season, and did a considerable amount of damage to the potatoe vines; in

one field of potatoes that I examined I found on nearly every plant from two to seven of them, busily employed on the leaves; their blue-gray dress contrasted well with the green of the leaves, and gave them quite a picturesque appearance. When disturbed, they did not attempt to fly, but let themselves fall from the leaves; however, when on the ground they were active enough, and soon hid themselves under stones or lumps of earth. While on the plants they appeared to be very peaceable, keeping together in small groups, but on some occasions they are sad cannibals. A friend of mine brought me some of these insects in a paper, and when I opened it there was only one alive; the rest of them were rather badly mutilated, some had lost their legs and some were minus their heads. I put them together again and the survivor immediately commenced a fierce attack on one of his slaughtered relatives, and did not seem one bit the worse after his strange repast.

DIAPHEROMERA FEMORATA.—I found this insect quite common here last summer; they do not seem to be particular in their choice of trees in this locality. I found them on Maple, Linden, Oak and Butternut, and early in the season I found a young one making a tour of discovery on an Elm that I had sugared for moths. I found the males much more active than the females, stalking up the tree when disturbed, while the females either remained quiet or dropped to the ground, rarely going up the tree. —F. B. CAULFIELD, Montreal, P. Q.

HESPERIA ILLINOIS IDENTICAL WITH HESP. ACANOOTUS, SCUDD.

I am informed by the best authorities that under the name of Hesp. "Illinois," I have merely re-described Mr. Scudder's *Hesp. Acanootus*, and I therefore hasten to make the necessary correction.

In comparing my supposed new species with specimens and descriptions of N. A. Hesperidæ, I was misled in regard to *Acanootus*, (which I had never seen,) by Mr. C. S. Minot's description of that species on page 150, vol. iv, of the CANADIAN ENTOMOLOGIST, which will be seen to differ in several important particulars from my description of what now appears to be the same species.

The majority of the females taken here also differ in the spots on the primaries from the female of *Acanootus*, as first described by Mr. Scudder.

The few extenuating circumstances mentioned above, do not, however, relieve me of the blame of having, with injudicious haste, re-described an old established species.—G. M. DODGE, Ohio, Ill.

The Canadian Entomologist.

VOL. V. LONDON, ONT., APRIL, 1873. No. 4

NOTES ON CASNONIA LUDOVICIANA, SALLE.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

Long, .30–.33 inch. Body elongated, glabrous, sanguineous, pilose. Head, disk of prothorax, and under surface black; head rhomboidal, middle wider than thorax, thence gradually constricted into a narrow rufous neck; eyes large and prominent; mouth parts, three basal joints, antennæ and legs rufous; eighth and ninth joints of antennae white, remaining joints black; prothorax elongate, cylindrical, piceous; humeral base and apex rufous, widest just behind middle, when viewed vertically two fine long yellowish erect hairs will be observed to arise laterally just before the middle, much longer than on elytra. Elytra faintly striate, striae with fine distant punctures, from each arise a single yellowish erect hair; intervals smooth, flat, elytral constriction at humeri narrower than middle of thorax, humerus slightly elevated, angles rounded, a wide black band on middle of elytra, sinuated above, arcuate below, apex truncate and tipped with black; knees darker than femora, posterior thigh with outer two-thirds black.

I am unable to detect any sexual dissimilarity.

Its larger size and finer punctured striae before band on elytra, and the white eighth and ninth antennal joints, easily distinguishes it from *pennsylvanica*. The Californian *picta* is unknown to me.

Habitat New Orleans, La. Mexico. Rare.

This charming addition to our North American fauna appears first due to M. Salle, of Paris, France, who (if I am correctly informed) about forty years ago took a unique near an old Saw Mill, in N. O. Subsequently, none others were known to occur until 1861, when an individual was attracted by the lamp of a Mr. Speck, which ultimately became the property of Mr. Salle, making the second specimen in all Europe. Mr. Trabranelt, a diligent collector who has resided here some eighteen

years, took the next three specimens, one of which he has lately exchanged to Mr. Salle.- Again, on Dec. 31st, '72, under some board traps in dry grass, near water, my first specimen occurred, and for three succeeding days a unique was taken. Their habits are probably gregarious, living on the ground, and as the collecting grounds in the vicinity of New Orleans are limited, owing to swamps, they may be found to occur more plentifully in Northern La. They are very active and graceful, taking alarm at the least noise, and run with great rapidity, keeping the antennae in constant vibration; when placed in a collecting bottle containing Cyanide of Potassium, they would seize hold of some other insect and proceed to drag it off, imitating certain species of ants. The drug, however, quickly quiets them.

ON MR. SCUDDER'S SYSTEMATIC REVISION OF SOME OF THE AMERICAN BUTTERFLIES.

BY AUG. R. GROTE., BUFFALO, N. Y.

[PAPER NO. 2.]

Since it is conceded that the law of priority is invariable in its application to zoological nomenclature, it remains for us to apply it to the determination of our Butterflies. That some inconveniences may arise from the correction of errors, does not militate against our desire to be right. The question is, are Mr. Scudder's genera well founded, or, are his names entitled to precedence, not is it convenient for us to use them. Without as yet entering an extended discussion upon the structural characters of our Butterflies, we will briefly notice Mr. Scudder's genera.

1. Oeneis, *Hubner* (1816.) The type and first species mentioned under this name by Hubner is *Norna*. While five species are cited under this genus, Hubner refers two more to Eumenis, viz.: *aello* and *tarpeja*. But the type of Eumenis is *E. autonoe*. It is difficult to avoid the conclusion that we must retain Oeneis to be correct, while regretting the necessary abandonment of Chionobas, so sonorous and accustomed a name. In our North American fauna we have, besides the species cited by Mr. Scudder, *Oen. chryxus* and *Oen. Uhleri*, described under Chionobas by Doubleday and Reakirt. Chionobas *Stretchii*, Edw., does not belong to

this genus, and is a synonym of Satyrus Ridingsii, I have been informed. *Oen. nevadensis* has been described by Behr.

2. Enodia, *Hubner* (1816). No one can possibly object to this designation for our *E. portlandia* on any score.

3. Minois, *Hubner* (1816.) This generic name has priority, and Mr. Scudder shows that it represents a distinct type. It cannot be objected to on any score. Besides *nephele* and *alope*, it includes *M. pegala*, *M. ariane* and *M. boopis*. The former is a Southern species, the *Papilio pegala* of Fabr., and thought to be a possible form of *M. alope;* the two latter are described by Behr under Satyrus.

4. Argus, *Scopoli* (1777). Mr. Scudder restricts Scopoli's term to our species, the *Hipparchia Boisduvalii* of Harris, enumerated under another name by Scopoli. To this procedure there is no objection, provided that Boisduval's types of Argus were not of those referred to the genus by Scopoli, which we cannot determine at the moment, when Boisduval's restriction would have priority. Hubner has, however, a Satyrid genus *Arge*, the type of which is *A. psyche*.

5. Megisto, *Hubner* (1816.) Hubner's type is *M. cymelia*, to which he refers Eurytus as a synonym. He includes in his genus Megisto Mr. Scudder's type of Argus. There can be objection to the use of the term if we do not follow Mr. Butler's Enlargement of Euptychia.

(To be Continued.)

NOTES ON THE HABITS OF THE ANT LION.

BY H. L. MOODY, MALDEN, MASS.

It was in April of 1872, while at Plymouth, Mass., with a party of friends in search of the Mayflower *Epigæa repens*, that I was so fortunate as to capture a specimen of the larva of this insect. It was quite by accident that it came to my hands. A friend and myself were lounging by the roadside, for want of better employment thrusting our fingers into the light sand, when with a jerk and exclamation my friend withdrew his hand to find this larva clinging with a most determined nip to a finger; it immediately dropped to the ground, however, and so quickly buried itself backward as to almost escape us, but a moment's lively digging revealed

it again, and I secured it in a pill box. On my arrival at home I provided a jar with a few inches of dry sand in the bottom, and placed the larva in it; it at once buried itself, and though I waited several hours, hoping to witness the commencement of its pitfall, there was no movement in that direction; there was now and then a slight stir of the sand, and once or twice the head was thrust above the surface, but quickly withdrawn at the slightest movement on my part. I grew tired of watching and retired for the night, returning in the morning to find a completed pit. It was in the form of an inverted cone, about one and one-half inches in diameter and three-quarters deep, and as smooth as sand could be made. At the first glance I discovered no sign of the builder, but a closer inspection revealed a pair of mandibles and at the base of them a pair of eyes; the bearer of these was snugly ensconced in the sand. The mandibles were stretched to their widest capacity and resting against opposite sides of the pit, so harmonizing in color with the sand as not to be readily noticed. In this position the larva would rest for hours unless disturbed, when it would withdraw from sight, but soon reappear and resume its watch.

My great interest, however, was in its method of taking its prey, and to witness this operation I provided a dozen or more ants of a small species, dropping them all into the pit at once; the larva with one sweep of its jaws secured three or four, and in a very short time killed or disabled them, but it soon dropped them and proceeded to kill most of the others before commencing its repast. Owing to their sluggish habit but very few succeeded in escaping. I was curious to see if the larva would attack as readily larger and more savage species, and the next day secured the largest specimens I could find of the Red Ant, *Formica sanguinea?*—noted for its courage and ferocity. I dropped the largest of these on the sand in the jar, leaving it to find its way into the pit, which it soon did, hesitating a moment at the brink and then walking to the bottom. At the instant that the ant came within reach the larva closed its jaws upon one of its legs, and for a few moments I witnessed quite an exciting contest, the ant turning and twisting to find its adversary and biting savagely at everything within its reach, the larva endeavoring to draw far back into the sand, thereby protecting itself and pressing the ant so close to the surface as to allow but very little room for movement. The ant finally freed itself from the jaws of the larva, but did not at once succeed in leaving the pit; the larva instantly almost entirely uncovered itself and slashed right and left with its mandibles, seeming to be in a perfect fury at

the loss of its prey. It also threw sand rapidly, but I could not see that the sand struck the ant except when it tried to escape up the side of the pit back of the larva; then the sand invariably struck it and brought it to the bottom. The ant finally escaped, but the next day was again caught and its juices sucked dry.

In no instance did I see so much resistance offered as in this case; usually the ants seemed to realize that their adversary was one with which they could not cope. From my observations I concluded that the larva trusted rather to its long mandibles and the inability of its prey to readily climb the walls of the pit, than to sand throwing where it did not capture them in the first attempt, for I saw it throw sand in but few instances. I did not see it in the act of digging its pitfall but once; it was then midnight and I did not stay to witness the completion. I noticed only that it threw the sand out with its head, working very rapidly. I have sometimes left the room to return in less than an hour to find a completed pit where before there was no sign of it. From the day of capture to May 11th I kept it supplied with ants, of which it destroyed numbers every day, but on the latter date, either by design or accident, its pit was filled level with the surface, and from this time to the time of pupating it dug none, remaining hidden most of the time and but once taking any food, then capturing an ant while concealed by a few grains of sand. On June 4th it constructed a round cocoon of silk, covered with grains of sand, and about one-half an inch in diameter. I presume it immediately pupated, but did not open the cocoon to ascertain. On July 8th the imago appeared and proved to be *Myrmeleon immaculatus*.

In the larva state it is certainly in some respects the most interesting insect I have ever seen, its very activity and pugnacity exciting admiration; its mandibles were always ready to close upon any intruding object. When I first obtained it I wished to preserve a description and in order to accurately observe the colors I was obliged to remove the fine grains of sand that were entangled in the short hairs on the body; this I did with a camel's hair brush, an operation to which the larva decidedly objected, but it stood its ground and fought it out, constantly seizing the brush between its mandibles, often in its attempts to reach it springing quite clear of the table.

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 6

BY E. T. CRESSON,

Continued from Page 54.

Genus TOXONEURON, Say.

The characters of this genus are given at length under the name of *Tenthredoides* (Proc. Ent. Soc. Phil., iv., p. 290), which appears to be synonymous. It may be easily recognized by the short robust body, rather large transverse head, stout legs, broad ample wings (which are generally fuliginous), and especially by the form of the marginal cell, which is rather suddenly constricted (or somewhat reclivate) at tip of second sub-marginal cell, and thence narrowed to the apex, which is somewhat incurved, and reaches the extreme apex of the wing; this, as well as the second and third submarginal cells, are indistinctly defined, the nervures being sub-obsolete.

The species, thus far known, may be distinguished by the characters given in the following table:—

Body entirely black.
- Wings entirely fuliginous.
  - Legs black, anterior knees honey-yellow.
    - Tibial spurs black ..... 1. ÆTHIOPS.
    - Tibial spurs white ..... 2. MINUTUM.
  - Legs black, anterior femora and tibiæ, and intermediate knees honey-yellow ..... 3. ORIZABÆ.
  - Legs honey-yellow, coxæ, trochanters, tips of posterior tibiæ and their tarsi black ..... 4. EXPLORATOR.
- Wings hyaline, apex fuliginous.
  - Legs entirely black ..... 5. MEXICANUM.
  - Legs black, anterior pair except base honey-yellow ..... 6. APICALE.
  - Legs black, anterior tibiæ and tarsi, base of intermediate tibiæ, their tarsi and band at base of posterior tibiæ white or yellow ..... 7. TIBIATOR.

Body black; head, pro and mesothorax and anterior legs flavo-ferruginous ..... 8. THORACICUM.

Body black; abdomen and legs flavo-ferruginous ..... 9. ABDOMINALE.

Body ferruginous; head, antennæ, metathorax and pleura black ... 10. SEMINIGRUM.

Body fulvo-ferruginous; mouth, antennæ, pleura beneath and metathorax black ..... 11. VIATOR.

Body yellow; three spots on mesothorax, spots on pleura, and abdomen, except base, black ..... 12. ORNATUM.

1. TOXONEURON ÆTHIOPS. *N. sp.*

♀.—Black, shining, clothed rather thickly with a short whitish pubescence; wings fuliginous, a sub-hyaline spot beneath base of stigma, posterior wings except tips and costa, hyaline; legs black, anterior knees bright honey-yellow, their tarsi palish. Length .25 inch.

Cordova, Mexico. (Sumichrast.)

2. TOXONEURON MINUTUM. *N. sp.*

♀.—Very small, black, shining, slightly pubescent; wings uniformly pale fuliginous, iridescent; legs black, tibial spurs white, anterior knees, their tibiæ, four anterior tarsi except tips, and intermediate knees pale yellowish. Length .10 inch.

Illinois.

3. TOXONEURON ORIZABÆ. *N. sp.*

♂.—Black, shining, slightly pubescent; mandibles, anterior femora except base, their tibiæ and intermediate knees, honey-yellow, tibial spurs black; wings fuliginous, iridescent, posterior pair sub-hyaline; abdomen flat, base tinged with piceous. Length .16 inch.

Orizaba, Mexico. (Sumichrast.)

4. TOXONEURON EXPLORATOR.

Bracon (Toxoneuron) explorator, Say, Bost. Jour. Nat. Hist., i, p. 259.

"Indiana" (Say); Illinois; Texas. The femora except base, and the tibiæ except apex of posterior pair, are bright honey-yellow; tibial spurs pale; in one specimen the posterior femora and tibiæ are dusky. Length .20 inch.

5. TOXONEURON MEXICANUM. *N. sp.*

♂ ♀.—Black, shining, rather thickly clothed with a short, white, sericeous pubescence; tips of mandibles brown; impressed lines on mesothorax and excavation at base of scutellum, crenulated; wings hyaline, apex beyond first cubital cell fuliginous, nervures black; spurs of anterior tibiæ pale. Length .25–.30 inch.

Cordova, Mexico. (Sumichrast.) Sometimes the posterior orbits are tinged with honey-yellow, and the pubescence on anterior tibiæ tinged with yellow.

6. TOXONEURON APICALE. *N. sp.*

♂.—Black, shining, clothed with a very short dull pubescence; sutures of mesothorax not crenulated; metathorax with strongly developed elevated lines; wings hyaline, apex fuliginous, leaving base of marginal and of second cubital cells hyaline; nervures and stigma black; legs black, anterior femora except base and their tibiæ entirely, bright orange-yellow, intermediate knees slightly tinged with testaceous. Length .20 inch.

Illinois.

7. TOXONEURON TIBIATOR.

Bracon tibiator, Say, Long's 2nd Exped., ii, p. 322; *(Toxoneuron)* Bost. Jour. Nat. Hist., i, p, 259.

"Pennsylvania" (Say); Illinois. A very pretty species, easily recognized by the white annulus at base of posterior tibiæ. Length .25 inch.

8. TOXONEURON THORACICUM. *N. sp.*

♂ ♀.—Black, shining; head, prothorax, mesothorax, spot beneath tegulae and anterior legs except coxae, trochanters and base of femora pale ferruginous; spot on cheeks beneath, mouth, more or less of clypeus and a spot between ocelli and eyes in ♂, black; wings uniformly blackish-fuliginous, nervures and stigma black; metathorax with strongly developed elevated lines, forming an ovate central area. Length .20 inch.

Cordova, Mexico. (Sumichrast.)

9. TOXONEURON ABDOMINALE. *N. sp.*

♂.—Black, clothed with a short dull pubescence; posterior orbits, legs except coxae and trochanters, and the abdomen entirely pale sanguineous; base of first abdominal segment tinged with yellow; wings dark fuliginous, nervures and stigma black; posterior tarsi dusky. Length .28 inch.

Illinois. *Bracon populator* (Say, Long's 2nd Exped., ii, p. 323), which is also referred to this genus by Say, and which, he says, is "a very common insect in many parts of the United States, does not appear to be a *Toxoneuron*, as the ovipositor is described as being longer than the abdomen." It is probably a true *Bracon*.

10. TOXONEURON SEMINIGRUM.

Tenthredoides seminiger, Cress., Proc. Ent. Soc. Phil., iv, p. 291, ♂ ♀.

Colorado. Colored much like *Microdus divisus*, described in the preceding paper (page 52); the form is, however, much more robust, and the neuration of the wings entirely different.

11. TOXONEURON VIATOR.

Bracon (*Toxoneuron*) *viator*, Say, Bost. Jour. Nat. Hist., i, p. 258.

"Indiana" (Say); Arizona. The specimen from Arizona has all the coxæ, except spot on two anterior pair beneath, concolorous with remainder of legs. Length .30 inch.

12. TOXONEURON ORNATUM. *N. sp.*

♂.—Lemon-yellow, shining; spot behind antennæ covering ocelli, extending to summit of eyes and from thence in a narrow line to occiput which it margins, three stripes on mesothorax, the central one broad and abbreviated behind, spot on scutellum, short line beneath tegulæ, furcate line on pleura, large spot on underside, posterior coxæ beneath and a spot above at base, their femora and tibiæ within, spot on each side of first abdominal segment, and the remaining segments except very narrow apical margins, black; flagellum brown; wings yellow-hyaline, apex fuscous, nervures and stigma reddish-brown; apex of abdomen compressed. Length .25 inch.

Cordova, Mexico. (Sumichrast.) A beautiful species.

Genus PROTEROPS, Wesm.

PROTEROPS CALIFORNICUS. *N. sp.*

♂,—Black; abdomen entirely ferruginous; wings uniformly blackish-fuliginous; antennæ as long as body; legs entirely black, slender. Length .30 inch.

California. (Behrens.) This is allied in general form to *Toxoneuron*, from which it is at once separated by the anterior ocellus being situated between the insertion of the antennæ. The neuration is also quite different.

SPECIFIC NOMENCLATURE.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

The publication of Mr. Scudder's Revision has caused much dismay among amateurs, on account of the numerous specific changes and minute generic sub-divisions which it proposes.

To students of Lepidoptera the novel, and in many cases, original views advanced afford a fertile field for discussion. Mr. Scudder has attempted to study the order by the same methods, and to correct its tangled specific nomenclature by the same principles which govern all other departments of Zoology.

This work is rendered very difficult from the fact that their beauty and the readiness with which they can be captured and preserved, has made them from the time of Linnæus a favorite order with collectors. Thus it was that many of the species have been described not by naturalists, but by amateurs; and genera founded on the most casual and unimportant characters. The confusion caused by the publication of superficial and carelessly written works, or of works in which the labors of preceding Entomologists have been neglected, it will take years to undo. Mr. Kirby, in his invaluable catalogue, has combined the results of the labors of European students in this direction, and adopted, although he did not fully carry out, the principles which Mr. Scudder followed strictly in his Revision.

Unless some definite law is laid down and universally observed, in regard to Entomological nomenclature, the Science will always remain in the chaotic condition in which it now is. Time will only increase the confusion; and now that a good remedy has been proposed, it would be folly to reject it, because of the temporary inconvenience it would occasion. The condemnation with which Mr. Scudder's book has been received seems to be founded, not on an intelligent rejection of his deductions, but simply on account of the trouble which a partial change of names would cause the present generation of students.

But is it not better to endure a slight and constantly diminishing evil for the sake of a future and permanent good?

There are two laws by which the nomenclature of a science may be governed, that of priority and the so-called law of convenience. The

former is fixed, immutable, and to it every possible case of generic or specific synonymy can be referred, and at once and for ever decided. The latter is relative, changeable, differing in various countries and among Entomologists of the same country. That which is convenient to European Lepidopterists is the reverse to American. A collector has a different standard of convenience from a naturalist. To reconcile all these different opinions is impossible; there is no rule which would be acknowledged by all.

Take as an example one of our common Hesperidæ, *Pamphila zabulon*, described by Boisd. & Lec. in 1833, and found in all the European collections under that name. In 1862 the same species was described in Harris, Ins. Mass., as *Hesperia hobomok*, and it is so named in most American collections. By the law of priority the matter would be at once determined in favour of *zabulon*. But which is the most convenient?—*zabulon* evidently to European Entomologists, and *hobomok* to American.

Here is a case in which the convenience of the two parties will always be opposed, and what rule have we to decide which is right? none, unless we accept priority as our guide.

Priority can be applied equally well to genera, but whether it would be advisable to change our families in accordance with it is, perhaps, doubtful, as the family name is not used in designating the insect and is therefore not of so much importance.

By accepting these laws as proposed by Mr. Scudder, we are under no obligation to follow him in his excessively fine generic divisions. It is the array of new names which gives his paper, at first sight, such a formidable appearance. I would be the last one to separate such closely allied species as *massasoit* and *zabulon*, *mystic* and *sassacus*, *polyxenes* and *troilus*, and many others which are placed in new genera.

But the questions which can be raised in regard to the expediency of using large or small genera, and others of like nature, will, in time, settle themselves, if we can establish our nomenclature on a firm foundation which will never be disturbed by subsequent investigation. This we think Mr. Scudder has done, and we hope that his work will be appreciated by American Lepidopterists.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 50.

GRACILLARIA.

If the rule holds good absolutely that the same generic name should not be used in Entomology and Botany, then *Gracillaria* must be dropped in one or the other. I do not know which has priority, but a name of a genus so old and well known as the *Gracillaria* of Micro-Lepidopterists ought scarcely to give place to an obscure genus of *Cryptogamia.*

EIDO ALBAPALPELLA.

Venillia albapalpella, ante v. 4, p. 207.

Dr. Packard calls my attention to the fact, which has slipped my memory, that *Venillia* is preoccupied among *Geometridæ.* I therefore substitute *Eido* for it.

PSORICOPTERA GIBBOSELLA, Stainton.

Adrasteia quercifoliella, ante v. 4, p. 206.

When '*Adrasteia*' was established I knew *Psoricoptera* only by name A specimen of *A. quercifoliella* which I sent to Mr. C. V. Riley, was pronounced by him to be nothing else than *P. gibbosella,* St. Mr. Riley states that he has bred the species from larvae feeding on Oak leaves, and that he compared his bred specimens with specimens in the collection of Mr. Stainton. He has also favored me with a generic and specific diagnosis of *P. gibbosella,* and I am satisfied that his identification of *A. quercifoliella* with it is correct. *Adrasteia* must therefore give place to *Psoricoptera,* and the species which I have placed in the former must be removed to the latter genus. Some of the other species (as *e. g. D? pseud-accaciella*) which I have placed provisionally in *Depressaria,* also approach very nearly to *Psoricoptera,* if they do not in fact belong *in* it.

PTEROPHORUS.

P. lacteodactylus. N. sp.

Creamy white. Head pale lemon yellow, except between the antennae where it is of the general creamy white hue; abdomen with a streak of pale lemon ye'low along the sides. *Alar ex.* 1⅛ inch. Kentucky, in June.

ADELA.

A. bella. N. sp.

Vertex, upper portion of the face, palpi and a long streak on each side of the thorax under the wings brilliant golden; lower portion of the face dark purple. ♀ with the basal half of the antennae dark purple, the remainder snowy white: in the ♂ only about the basal third is purple. Thorax above the wings and both pairs of the wings dark shining purple, the thorax and primaries with a golden gloss and appearing, according to the light, dull brown purple, violaceous, or golden; before the apex of the primaries are three narrow, and in some lights, indistinct fasciae, the color of which varies with the light and all of which are faintly dark margined both internally and externally; the third fascia is at the apex. The fasciae when most distinct have a silvery lustre.

Al. ex., ♂ ½ inch; ♀ a little larger. Kentucky.

A fresh or living specimen of this insect is a gorgeous creature, but after death the colors become dull. I am not acquainted with the larva. The imago may be taken in May, feeding upon the flowers of the "Climbing Bittersweet" (*Celastrus scandens*), and a little later it is not uncommon resting upon leaves along paths or roadways through the woods.

DICTE, *gen. nov.*

Head, face as broad as the thorax; head and face, basal joint of the antennae and first and second joints of the labial palpi clothed with long loose hair-like scales; antennae with the basal joint incrassate, stalk simple, reaching to the apex of the wings; maxillary palpi microscopic; labial palpi drooping (in the dead insect), the terminal joint projecting forwards and a little upward, and about two-thirds as long as the second joint. (If recurved the palpi would reach the vertex.) Tongue naked, rather longer than the thorax; eyes globose, prominent.

Wings deflexed; anterior oblong ovate, obtusely pointed, with moderately long ciliae. The costal vein attains the margin about the middle. The subcostal curves gradually into the discal, giving off a long branch before the middle, a shorter one behind the middle, then a furcate one which curves upwards to the costal margin, whilst the apical branch also curves up from its junction with the discal vein to the margin just before the apex; the discal vein closes the discal cell and sends three branches to the posterior margin; the median is straight to the discal, where it becomes furcate, both branches attaining the posterior margin; submedian simple.

Posterior wing about as wide as the anterior, sub-ovate, the apex pointed and the costal margin but slightly convex; the costal attains the margin behind the middle; the discal cell is closed by a much curved discal vein which emits two branches to the posterior margin; the subcostal sends a branch to the apex from near the end of the cell and beyond the discal vein becomes furcate, both branches attaining the margin behind the apex. Median and submedian both simple, and both attain the posterior margin.

The roughened head and palpi and the shape and neuration of the wings ally this genus to *Tenea* and its congeners.

D. corruscifasciella. N. sp.

Head, palpi, basal joint of the antennae, thorax and basal half of the anterior wings golden yellow; antennae glistening snowy white, the apical half annulate with velvetty black; just before the middle of the anterior wing, in the yellowish portion, is a brilliant metallic fascia. The central portion of the apical part of the wing is occupied by a large, nearly circular, greyish drab spot, containing four longitudinal velvetty black streaks, bordered before by a brilliant metallic costal streak which points towards the fascia; and behind by a similar costal streak pointing towards the dorso-apical margin. The grayish drab spot is separated from the

underneath the bark of Hickory trees, and suspected it of making galleries under the bark. Dr. Clemens more correctly suspected that it was lichenivorous and hoped that Mr. Walsh might ascertain its larval history. Alas! the researches of both have terminated forever.

Only the male was known to Dr. Clemens, and from his description I think his specimen must have been somewhat rubbed. Male, "Head and face dark gray. Antennæ dark gray, slightly spotted with white." Fore wings dark gray at the base, remainder paler, sprinkled irregularly with dark spots and scales. Ciliae grayish white. "Hind wings gray." (The quotations are from Dr. Clemens' description.) The female is apterous, with the head clothed with hoary scales and a tuft of the same at the apex; but the body is nearly naked. *Al. ex.* 5/8 inch. Kentucky. Common.

The larva feeds upon lichens and may be found in March and April, feeding up. It becomes a pupa in April and the imago emerges about a week thereafter. The larva is whitish, head black, upper surface of the two succeeding segments shining yellowish brown, anteriorly margined with white. The case is prismatic in outline, and of an almost leathery consistence, about 1/3 of an inch long, and tapering slightly towards each end; it is composed of silk, sand, particles of lichens, and excrement of the larva, and I have sometimes found small Molluscous shells adhering to it.

ON SOME OF OUR COMMON INSECTS.

IV.—*THE ISABELLA TIGER MOTH.*

Pyrrharctia (Spilosoma) Isabella.

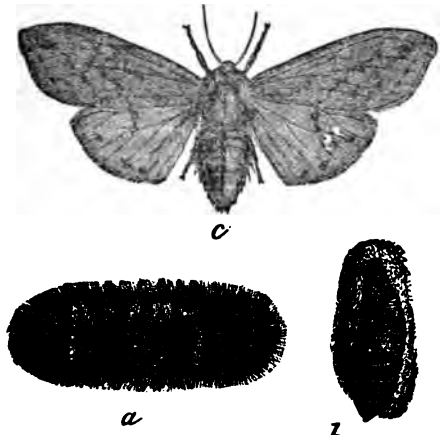
BY W. SAUNDERS, LONDON, ONTARIO.

There are but few of our readers who are not familiar with the caterpillar of the Isabella Tiger Moth, one of our commonest "woolly bears," and found, we believe, in almost every part of Canada and the Northern United States. This larva, in common with many other members of the family *(arctiadæ)* to which it belongs, hybernates during the winter. It acquires nearly full growth in the autumn, and then, having selected a cosy sheltered spot under bark, log, rail, stone or board in which to hide, it

coils itself up there into a sort of ball and sleeps through the long and dreary winter, and about the time when the birds come back and the warm days of spring begin, this bristly creature rouses itself to begin life anew. Hence it is one of the few caterpillars which present themselves to us full grown in early spring, and from its peculiar appearance can scarcely fail to attract attention. It has not to wander far for food, for, being in possession of an omnivorous appetite, it feasts on the first green thing it meets with, grass, or weed, or early plant, and having fed but a short time, it spins its cocoon and becomes a chrysalis.

The caterpillar is about an inch and a quarter long; its head and body are black, and it is thickly covered with tufts of short, stiff, bristly hairs, which are dull red along the middle of the body and black at each end. When handled it immediately coils itself into a ball and remains for some time motionless. It is very tenacious of life; we have known the larva to be frozen in a solid lump of ice, and when thawed out move around as if nothing had happened. It sometimes occurs, although very rarely, that this larva becomes a chrysalis early in the fall, and produces the moth the same season. We have never met with an instance of this but once, see CAN. ENT., vol. i, p. 26; its usual course is that which has already been partially described.

Fig. 14.



Its cocoon, *b*, fig. 14, is spun in some secluded nook, and is of a dark color, of an elongated oval form and curiously wrought with a network of silk, in the meshes of which are interwoven the black and red hairs from the body of the caterpillar. Within this enclosure the insect changes to a dark brown chrysalis, and remains as such about two or three weeks, sometimes longer, when the moth having burst its shelly covering, softens the silky fibres of which its cocoon is formed by a liquid with which it is furnished, and makes its exit through a hole at one end of the cocoon.

The moth, *a*, fig. 14, when its wings are spread, measures about two inches. Its wings are of a pale yellowish buff colour, with a few dull

blackish dots more numerous on some specimens than on others. The hind wings are sometimes paler than the fore wings, and at other times tinged with orange red, while in other specimens we have observed that the under surface of the fore wings assumed a dull rosy hue. The body is a little deeper and richer in colour than the wings, and the abdomen is ornamented with longitudinal rows of black dots; on the upper surface there is a row down the middle of the back, and one on each side, and on the under surface there are sometimes two additional rows of smaller dots.

Although this insect is so common and well known in its larval condition, it is not often seen on the wing. It flies at night, and being seldom attracted by lights, it rarely finds its way into our houses. It is also probably subject to the attacks of ichneumons, which destroy some of the caterpillars before they reach maturity.

ON THE GEOGRAPHICAL DISTRIBUTION OF SOME GENERA OF CANADIAN INSECTS.

BY FRANCIS WALKER, LONDON, ENGLAND.

Before leaving the Canadian *Chalcidiæ*, in hope of returning to them when many more genera are discovered in Canada, I will mention *Megastigmus*, which very probably occurs there; it is a genus of *Torymidæ*, and, in some respects, connects that family with the *Eurytomidæ*, and is next to the latter in the interest with which it may be regarded in case there is a foundation for the report lately published concerning the seed-eating habits of the species which represent it in California. But this does not seem probable, as it is certainly carnivorous in Europe, where two species exceed the others in beauty and are especially conspicuous, the great *M. giganteus* that maintains itself on the *Cynips* of a one-chambered gall in the Mediterranean region, and *M. dorsalis* that, with various other species, lives on the substance of the *Cynips* of the many-chambered Oak Apple of North Europe. I have seen other species near London and in the Alpine vallies of Switzerland, and they are attractive on account of their comparative rarity, though their economy is but little known. The natural history of the Australian species may be unknown for some time to come, and I hope that its discovery will be preceded by attention to the Canadian galls and to their parasitic inhabitants.

SIREX.—This genus is well known by the large size of the few species that have been discovered and by its especial habitation in the North. I have mentioned elsewhere its occurrence in Eastern Siberia, which may have been the earlier habitation of the European species, and wherein some of the North American species also dwell, such as *S. gigas*, *S. albicornis*, *S. juveneus*, *S. spectrum* and *S. flavicornis*. *S. juveneus* has appeared as far south as Algeria, and *S. cedrorum* is contemporaneous with the cedars on Mt. Lebanon. *S. varipes* and *S. dimidiatus* inhabit North America, and there are three apparently undescribed species from that region and one of small size from Mexico. There are two in North Hindostan and one in Australia, and three or four whose native country is unknown to me. It does not appear that distance in space between two species is accompanied by corresponding difference in character, for the Australian species is very nearly allied to *S. juveneus*. In the neighbouring genus, *Tremex*, the European *T. juxicernis* is represented in North America by *T. columba*, and there are three undescribed species, one of North America, one of Hindostan, and one of China.

NOTES ON COLLECTING.

BY THEODORE L. MEAD, NEW YORK.

Last season, while in the Catskill Mountains, I made some experiments in sugaring for moths, which may be interesting to collectors.

The sugaring mixture employed was "molasses sugar" and water, in the proportion of three or four pounds to the gallon; I could not perceive that other additions, such as alcohol or preserved fruit, &c., were of any advantage.

About twenty trees in an orchard were sugared, but very few moths were seen for the first night or two, though as afterwards they came in immense numbers, it would seem that a little time is required for the news to spread.

Having found a cyanide poison-bottle to be very useful in killing small Diurnals, and noticing the almost universal habit of these moths, when disturbed, of darting downward before flying away, it occurred to me to make a poison-bottle on a large scale and to dispense with a net, always so inconvenient to use at night.

Accordingly I procured a quart bottle with as wide a mouth as possible—a fruit jar would have done very well—put in it enough lumps of common fused cyanide of potassium to cover the bottom, and having poured upon this about an inch of plaster of Paris mixed with plenty of water, I had only to await nightfall to commence operations.

The large poison-bottle worked to a charm; scarcely a moth escaped which I desired to take. With the new instrument I became impatient of the time required to take out and pin each specimen as soon as stupefied, and tried the experiment of capturing every uninjured moth seen and allowing them to remain in a layer upon the plaster until it was convenient to return to the house and sort them over, taking a moderate amount of care that they should not be unnecessarily shaken up in carrying.

Rather unexpectedly I found that this treatment did not seem to injure or rub the specimens in the least degree, though sometimes nearly a hundred moths of all sorts and sizes would be piled together, making a stratum an inch or two thick in the bottle.

After this discovery night collecting became easy, nets and boxes were left at home, and the only necessary articles were a lantern and the poison-bottle. Arrived at a tree and carefully turning the light upon the sugared patch, I selected out such moths as seemed desirable, and, removing the stopper, gently touched them from below with the open bottle. When they had flown down into the receptacle, the cork was replaced and the specimens were thus safely disposed of till the following morning, when they could be sorted over at leisure.

Occasionally a very wary moth would fly away at the first approach of artificial light, and I endeavored with laudanum and hydrate of chloral to so stupefy them that they could be readily taken. The laudanum was rather too effective, seeming to intoxicate them; at any rate, after imbibing the mixture, the moths fell off the tree and sprawled around in the grass in a very absurd manner, quite unable to fly away; but still most of them managed to go a considerable distance, and so were lost in the grass. The hydrate of chloral had no effect whatever upon them; some moths which took a considerable quantity of a very concentrated solution—about equal bulks of the salt and of water—remained unaffected.

Sometimes ants were troublesome, biting the trunks of the moths as they fed, and causing them to fly away. In these cases a dose of laudanum was generally effective in driving off the ants for a considerable time.

Strips of white cloth nailed upon the trees were very convenient to receive the sugar, though not necessary. One afternoon, while preparing my baits for evening, a fine *Grapta Interrogationis* hovered around the tree for a moment and then lit close by, and unrolling its proboscis, feasted on the nectar. While engaged in this absorbing operation I readily captured it between thumb and finger. In some localities where rare species are to be found, it may be worth while to try sugaring for butterflies as well as moths.

The vapor of hydrocyanic acid in the poison-bottle, as a rule, did not change the colors of specimens even after prolonged exposure. But a single moth of those collected, a pinkish *Crambus*, was faded by it, changing to olive brown.

At my suggestion cyanide of potassium was adopted by the American Museum of Natural History, to preserve their Entomological collections from the ravages of insects. At first small tin boxes were used, but the salt chrystallized upon the tin and made its way over the edge and down the sides of the receptacle, staining the cabinet drawers. Finally small glass capsules were used to contain the poison, and proved satisfactory. The vapors render it unpleasant to work over the drawers while the capsules are in them, but with the temporary removal of these the inconvenience ceases. A fly or other small insect introduced into one of the cases, dies in a very short time, and the protection against Dermestes is very complete, though of course it is hardly advisable to use this method where the drawers are not nearly air-tight. Still I think that every Entomologist would find a single tight receptacle thus poisoned very useful as a sort of quarantine for suspected specimens. Even delicate green *Geometrae*, after being in an atmosphere of prussic acid vapor for months, have, so far, shown no change in color.

THE South London Entomological Society, which, though only nine months old, has been extremely successful, held on Thursday evening last, at Dunn's Institute, Newington Causeway, a very interesting exhibition of collections of insects, chiefly British Lepidoptera. The collections were made by the members themselves, all amateurs, and do them the greatest credit. The room was densely crowded, and the exhibition was a great success.

The Canadian Entomologist.

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HYPENA SCABRA (FABR.) AND H. ERECTALIS, GUEN.

BY J. A. LINTNER, ALBANY, N. Y.

In the examination of my last season's collections of *Hypena scabra* (scabralis, Guen.,) and "*H. erectalis*," for sexual determinations, I was surprised to find of the former, only the male represented, and of the latter, only the female. Collections of each having been made during the same period of time (from September 1st to September 24th) and at the same place (the wall and ceiling of the piazza of my residence)—such a remarkable occurrence seemed to be so removed from accident, and inexplicable from any difference of sexual habits, that I was led to suspect the identity of the two species. On referring to my cabinet, I there found individuals labelled as ♂ and ♀ of each species; but, on a critical review of these determinations by an infallible method of distinguishing sex in the Heterocera, viz., the structure of the *frenulum* (simple in the male and compound in the female), my "♀" *scabra* proved to be a ♂, and my "♂" *erectalis* a ♀. Among my duplicates of the collections of several years, the same result obtained. Mentioning these facts to my friend, Mr. Meske, of this city, he was quite positive of having in his cabinet the sexes of each species, but he subsequently found that a frenulum inspection of all his examples gave him only one sex of each form. There was, therefore, no longer room for doubt of the identity of the "two species"—that "*erectalis*" is only the female (though uniformly smaller) of *scabra*.

It is interesting, in connection with the above, to notice that Guence, in his description of *scabralis*, refers to seven ♂'s under his observation, and says, "Je ne connais pas la ♀." Of *erectalis* he says, "3 ♂, 1 ♀." Mr. Grote (Trans. Amer. Ent. Soc., iv, p. 102) cites ♂ and ♀ of *erectalis*

and *scabra*. The varying form of the abdomen of *scabra*—each sex often assuming the form pertaining to the other—may have easily led him into this error,as it had done with me in those which I had placed in my cabinet.

A strong testimony to the value of the investigations in which the eminent German Lepidopterist, Dr. Speyer, is at present engaged, in his examination and comparison of the identical or closely allied forms of European and American Heterocera, is given in the fact, that from the study of a small number of *scabra* and *erectalis* submitted to him (perhaps three of each form), he was led to believe that the two would prove to be but one species. This opinion was recently communicated by him in a letter to Mr. Meske. Before its reception, the conclusion, confirming his belief, to which I had arrived, through an examination of abundant material, had been forwarded to him.

There seems to be no sufficient reason at present for changing the *scabra* of Fabr. into the *scabralis* of Guenee—the true relations of the Deltoidæ, whether to the Noctuas or to the Pyralites, being still a matter of opinion and discussion.

I embrace the present opportunity to communicate the fact, that an example of *Depressaria Ontariella* Bethune, sent by me last fall to Dr. Speyer, and by him submitted to Zeller, was by the latter determined to be *D. heracliana* Deg. The opinion of Mr. Angus, recorded in vol. 2, p. 19 of this Journal, that it was probably identical with the above named European species, is hereby confirmed.

DESCRIPTIONS OF NORTH AMERICAN HYMENOPTERA, No. 7

BY E. T. CRESSON, PHILADELPHIA, PENN.

Continued from Page 54.

Genus HELCON, Nees.

Posterior femora toothed beneath near apex.
- Body entirely black, legs ferruginous.....1. OCCIDENTALIS.
- Body black and ferruginous.
  - Abdomen black, with broad median ferruginous band...2. BOREALIS.
  - Abdomen entirely ferruginous.
    - Metathorax and pleura more or less ferruginous; posterior tarsi white.....3. ALBITARSIS.
    - Metathorax and pleura black; posterior tarsi black.4. FRIGIDUS.

Posterior femora simple.
Body entirely black.
Legs entirely honey-yellow or ferruginous.
Wings hyaline; first abdominal segment narrow, shining .....5. AMERICANUS.
Wings fuliginous; first abdominal segment broad, opaque.....6. FULVIPES.
Legs ferruginous, posterior femora, tibiæ and tarsi black.7. PEDALIS.

1. HELCON OCCIDENTALIS.

Helcon occidentalis, Cress., Proc. Ent. Soc., iv, p. 292. ♀.

Colorado.

2. HELCON BOREALIS. *N. sp.*

♂.—Black, opaque; clothed with a short thin pale pubescence; top of head, cheeks and space on side of pleura smooth and shining, face finely and densely punctured; antennæ long, slender, brown; thorax densely, rather roughly sculptured, somewhat coriaceous; metathorax densely and coarsely sculptured; tegulæ dull honey-yellow; wings hyaline, iridescent, nervures and stigma fuscous; legs bright honey-yellow, anterior coxæ tinged with fuscous, posterior tibiæ black, reddish at base, their tarsi pale yellow, dusky at tips, femoral tooth strong and blunt; abdomen depressed, first segment coriaceous, second and third segments honey-yellow. Length .33 inch.

Maine.

3. HELCON ALBITARSIS. *N. sp.*

♂.—Head, pro and mesothorax, scutellum and sometimes the pleura entirely black; remainder honey-yellow or ferruginous; sometimes the pleura is entirely ferruginous, and sometimes the metathorax is obscurely ferruginous, nearly brown; antennæ black or brown; head and thorax sculptured as in *borealis*, the metathorax being more distinctly reticulated; tegulæ honey-yellow; wings hyaline, iridescent, nervures and stigma fuscous; legs bright honey-yellow, posterior tibiæ black, reddish at base, all the tarsi white, dusky at tips, femoral tooth acute; abdomen narrow, shining, first and second segments reticulated; apical segments sometimes tinged with dusky. Length .27–.35 inch.

Virginia; Illinois. This may be the male of *dentipes*, Brulle, the female of which is described as having a white annulus on antennæ, and the tarsi are not conspicuously white as in *albitarsis*.

4. HELCON FRIGIDUS. *N. sp.*

♀.—Black, shining; face rough; antennæ slender, black; prothorax except posterior angles, semi-circular band on pleura, disk of mesothorax and basal excavation of scutellum, covered with coarse striæ or reticulations; metathorax coarsely reticulated; tegulæ piceous; wings smoky hyaline, nervures and stigma black; legs, including coxæ, rufo-ferruginous, tarsi tinged with yellowish, posterior tibiæ blackish, femoral tooth strong and very blunt; abdomen longer than thorax, narrow, polished, ferruginous, dusky at base, first segment with two longitudinal ridges and a stout blunt tubercle on each side near base; ovipositor longer than body, honey-yellow, sheaths black. Length .45–.50 inch.

Hudson's Bay; Vancouvers' Island (Henry Edwards.)

5. HELCON AMERICANUS. *N. sp.*

♀.—Black, shining; face roughened; prothorax and metathorax reticulated; labrum and mandibles except tips ferruginous; palpi pale yellowish; antennae long and slender, brown-black, base honey-yellow; middle lobe of mesothorax prominent, divided from the side lobes by a deep groove which become confluent behind; tegulae and base of wings honey-yellow; wings hyaline, sub-iridescent, nervures and stigma black; legs honey-yellow, posterior tibiae and tarsi more or less dusky, femora simple; abdomen long, slender, shining, sides and base of second and third segments tinged more or less with testaceous, first segment long, narrow, grooved medially; venter more or less tinged with testaceous; ovipositor very long and slender. Length .55–.60 inch.

Canada; Virginia. Very distinct from *fulvipes* by the shape and sculpture of the first abdominal segment.

6. HELCON FULVIPES.

Helcon fulvipes, Cress., Proc. Ent. Soc. Phil., iv, p. 292. ♀.

Colorado.

7. HELCON PEDALIS. *N. sp.*

♂ ♀.—Same form and sculpture as *fulvipes*, from which it differs by the posterior femora except base, and their tibiae and tarsi being black. Length .40–.48 inch.

Hudson's Bay; Massachusetts.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 50.

TINEA.

1. *T. cunitariœella. N. sp.*

Black; head and face rufous; palpi grayish white; antennae yellowish gray, annulate with black, tips white; wings black, with a costal and dorsal white spot opposite each other just before the middle (sometimes united, forming a fascia), a white fascia (sometimes interrupted) beyond the middle, a costal white spot in the apical portion of the wing, and near the apex an obliquely curved costal white streak; apical portion of the wing bronzy, iridescent, ciliae grayish brown; legs silvery white, in parts tinged with fuscous; posterior wing fuscous. *Alar ex.* less than ⅓ of an inch.

The larva is found upon old stone walls and monuments in cemeteries. I do not know whether it feeds upen the hairs contained in the mortar of the walls or upon the mortar itself, or upon Lichens, but upon the wall where I have found it most abundantly, I have never found a trace of Lichens. The case is composed of silk and grains of lime. It is flattened, with the under surface truncate at each end, and the upper surface projects in shape something like the bowl of a spoon at each end; the sides are emarginate near each end. I have lost my notes upon the larva. *Hab.* Kentucky and the Gulf States.

It is one of the handsomest *Tineæ* known to me.

2. *T. Orleansella. N. sp.*

Straw color or pale yellowish, thickly dusted with fuscous; a discal fuscous spot about the middle of the wing, and another opposite to it on

the dorsal margin; a row of dark brown spots around the apex, a dark brown spot on the base of the costa and an obscure one at the inner angle: the apical portion of the wing is thickly dusted. Antennae grayish stramineous: head and palpi sordid stramineous, the outer surface of the palpi brown. *Alar ex.* 3/8 inch. New Orleans, La., in November.

3. T. auristrigella. N. sp.

Head and antennae straw color or pale golden, palpi silvery; thorax and wings brown in some lights, bright purple, roseate or violaceous, with a wide shining straw colored or pale golden streak upon the fold, beginning at the base of the costa and extending to and into the beginning of the dorsal ciliae, and sometimes connected with a large straw colored or pale golden costal spot before the costal ciliae; ciliae pale golden *Alar ex.* 3/8 inch. Kentucky, in July.

4. T. straminiella. N. sp.

Head sordid yellowish; palpi, antennae, thorax and anterior wings straw color, palpi brownish externally; sides of the thorax behind the eyes brown; a row of small brown spots along the fold, another at the end of the disk. Apex dusted with brown. *Alar ex.* 1/3 inch. Kentucky, in June.

5. T. iridella. N. sp.

Palpi and lower part of the face brownish; upper portion and vertex yellowish; antennae brown; thorax and anterior wings iridescent, in some lights brown, in others glittering bluish green, violet or topaz red. In some lights the entire wing appears of a beautiful azure. Posterior wings pale fuscous. *Alar ex.* 3/7 inch. Col. Mr. Wm. Saunders, of London, Ontario, Canada.

A beautiful insect under the microscope.

6. T. misceella. N. sp.

Head and palpi pale yellowish; antennae pale fuscous; thorax and primaries fuscous and saffron yellow intermixed in almost equal quantities, the fuscous scales being sometimes aggregated into small spots, one of which is about the end of the disc and a larger one is near the base. *Alar ex.* 3/8 inch. Kentucky.

7. costotristrigella. N. sp.

Head and palpi pale saffron yellow, the outer surface of the palpi dark brown; antennae dark brown; thorax and basal portion of the dorsal margin of the primaries dark brown dusted with yellowish white, the primaries otherwise white dusted with dark brown, with an oblique dark costal streak near the base, extended to the fold; just before the middle is another longer one also extended to the fold where it enlarges into an irregular spot, being also dusted with yellowish white above the fold; just behind the middle is another streak not reaching the fold, behind which is a small costal brown spot and a row of brown spots around the apex. The apical portion of the wing is more densely dusted than the disc. Ciliae white with fuscous spots. *Alar ex.* ½ inch. Kentucky, in August and September. Taken flying.

8. T. bimaculella. N. sp.

Outer surface of the second joint of the labial palpi brown; inner surface and terminal joint pale yellowish or stramineous; head pale stramineous; antennae pale yellowish tinged with fuscous; thorax shining dark brown, almost black, except the tip which is stramineous; costal half of the primaries fuscous, narrow towards the base, but spreading towards the apex, where it is mixed with pale yellowish, with a distinct dark brown spot beyond the end of the disc; dorsal half stramineous, widest at the base, narrowing towards the apex, with a distinct dark brown spot within the margin about the middle: ciliae fuscous and stramineous mixed; anterior and intermediate legs dark brown, the tarsi faintly annulate with stramineous; posterior legs stramineous. *Alar ex.* ⅓ inch. Kentucky.

9. T. aurosuffusella. N. sp.

Palpi pale stramineous, the outer surface of the second joint of the labial pair brown; antennae pale fuscous; head and thorax pale stramineous, with a small pale fuscous spot on the thorax before the apex; primaries pale stramineous streaked along the fold with pale reddish golden, and the apical portion of the wing suffused with the same hue; a rather wide pale fuscous streak, the basal portion of which is scalloped towards the fold, extends from the base of the costa along the costal margin to a little beyond the middle, and a similar streak, scalloped towards the fold in its posterior half, extends along the dorsal margin from near the base to the

beginning of the ciliae; and at the beginning of the costal ciliae is a rather wide somewhat oblique streak or band which extends almost to the dorsal margin and is a little convex towards the base; ciliae pale stramineous. *Alar ex.* 7/16 inch. Kentucky.

10. T. griseella. N. sp.

Palpi brown; head and antennae sordid yellowish gray; thorax and primaries brownish gray, with a small brownish spot within the dorsal margin before the middle, another still more faint on the disc, and a more distinct one at the end of the disc. *Alar ex.* 5/16 inch. Kentucky.

11. T. marginistrigella. N. sp.

Palpi yellowish white, the labial pair brown externally and tipped with white; head whitish yellow; thorax dark brown with a faint golden tinge; primaries dark golden brown, with some white intermixed, especially in the basal portion and along the dorsal margin to beyond the middle; the white of that part of the dorsal margin is arranged in numerous narrow short streaks which are perpendicular to the margin; a large white patch at the beginning of the dorsal ciliae, sparsely dusted with brown; a row of white spots extends along the entire costal margin from near the base; two of these spots about the middle being much larger than the others; extending to the middle of the wing, and only separated from each other by a narrow crooked brown line. The margin just before and at the apex is white, much dusted with brown and separated from the dorsal white patch by a patch of brown. Ciliae white with about seven or eight brown spots extending into them. *Alar ex.* ½ inch. Kentucky.

12. T. trimaculella. N. sp.

Pale stramineous, the head a shade deeper yellow; thorax and primaries dusted with pale fuscous; two small fuscous spots upon the disc about the middle, the one nearest the costal margin being the most indistinct, and a third one more distinct at the end of the disc; posterior wings shining pale or whitish yellow. *Alar ex.* 7/16 inch. Kentucky.

13. T. fuscomaculella. N. sp.

Gray, flecked and spotted with fuscous, which in some lights appears reddish or brownish golden; one of the spots is at the base of the costa, and opposite to it on the dorsal margin is a smaller one connected with it

by scattered fuscous scales ; a fuscous streak from the costa to the fold sometimes almost interrupted in the middle ; an oblique fuscous streak about the apical third of the wing and a small dorsal spot opposite to it, and another small spot of the same hue near the apex ; antennae silvery gray ; face and palpi whitish, outer surface of the palpi dusted with fuscous. *Alar ex.* ½ inch. Kentucky.

The antennae in this species and in the one next described are rather longer than is usual in *Tinea*. The neuration of the wings in both these species is also different. But I have not thought it necessary to make a new genus for them upon this account, the more especially as the neuration is by no means constant among the different species of *Tinea*, and these two species differ somewhat from each other in neuration. There are also minute differences in the form and relative size of the joints of the labial palpi between the preceding species and these two. This species and the next differ from the others and agree with each other in having the costal margin of the hind wings excised from the middle to the tip. For these reasons I had at first intended to place them in a separate subgenus, but as they differ from each other somewhat, especially in neuration and pattern of coloration, and agree with *Tinea* otherwise than as above quoted, I have concluded not to remove them from this genus. The next described species has the scales of the thorax and wings appressed and smoother than in the other species.

14. T. argenti-strigella. N. sp.

Face and palpi silvery white, outer surface of the labial palpi brown ; antennae silvery beneath, maroon brown above, annulate with silvery white ; vertex maroon brown ; thorax above, a spot under each wing and the basal portion of the primaries rich maroon brown, or in some lights violaceous, with a narrow irregular white fascia upon the wings behind the maroon basal portion ; behind the fascia the primaries are maroon brown or violaceous, mixed with white towards the fascia, the white gradually disappearing towards the apex. Six oblique silvery costal streaks, the first being small and the others becoming gradually larger to the fifth, the sixth again being smaller ; two distinct dorso-apical white streaks and a small patch of maroon dusted with white in the dorso-apical part of the wing, which is continuous with those of the five dorsal silvery streaks ; dorsal ciliae silvery ; abdomen violaceous, each segment silver fringed ; legs silvery iridescent. *Alar ex.* ½ inch. Kentucky.

A very handsome species.

The following species differ from the true *Tinea* as follows: the antennae are shorter and thicker, with the joints shorter and arranged like a series of cups placed in each other, and microscopically ciliated (or rather pubescent.) I have not thought it necessary to erect a new genus however, as in other respects they agree with the true *Tinea*.

15. T. auropulvella. N. sp.

Snowy white; outer surface of the second joint of the labial palpi brown; antennae yellowish white; primaries very sparsely dusted with pale reddish or brownish golden, except in the apical portion, where the dusting is rather dense; it is also thicker near the base of the dorsal margin. A dark brown spot on the costa at the extreme base; another larger one on the costa near the base; a smaller costal one just before the middle; a large one just behind the middle reaching to the fold; another small one before the ciliae and five or six other small ones extending around the apex at the beginning of the ciliae; in some lights these spots are distinctly golden brown. *Alar ex.* $\frac{7}{16}$ inch. Kentucky. Taken in July resting upon the trunks of trees in forests. It is rather sluggish and does not easily take flight.

16. T. fuscobulbiella. N. sp.

of the same hue reaching to the fold and pointing towards a spot of the same hue just within the fold; a small spot of the same hue about the middle of the costa, behind which is an irregular costal streak of the same hue which extends to the middle of the apical portion of the wing and widens into a large irregular spot; in the apical part of the wing is an indistinct *longitudinal* dorsal streak, nearly opposite to which, but a little behind it, is a larger and more distinct streak which is also longitudinal. All of these spots are mixed with or margined by reddish yellow scales; ciliae white dusted with dark brown. *Alar ex.* 7/8 inch. Kentucky.

The three foregoing species thus resemble each other and differ from the others in ornamentation as well as in the structure of the antennae. They were all three taken in the same situations.

ON THE HABITS OF CERTAIN GALL INSECTS OF THE GENUS CYNIPS.

BY H. F. BASSETT, WATERBURY, CONN.

For ten years past I have been studying the habits of the Cynipidæ to determine, if possible, whether there are one or two broods of these insects each year.

Several years ago I discovered the flies of *C. q. operator* in the act of ovipositing in the young acorns of *Quercus ilicifolia*, the oak on which the woolly galls of this species are generally found. The insect thrust its ovipositor down between the acorn and the acorn cup, and, late in the summer, the acorns thus stung proved abortive, while around them and often protruding far above the cup were little acorn-like galls, each containing a large Cynipideous larva. Several of these galls were often found in each acorn cup. That year nearly all the acorns were affected, and there are more or less thus injured every year.

I have as yet failed to rear any flies from these galls, probably because I have failed to keep the galls in the proper condition for developement.

A later discovery, made three or four years ago, was that of two, and I think three species of Cynips in the act of ovipositing in the buds of the oak, *Q. alba*, just as the buds began to develope, but before the leaves were visible.

The relationship of these species to any known species was only inferentially established. It is true that the leaves of several oaks on which I found one species very abundant, were almost all covered with galls of *C. q. futilis*, *O. S.*, but the females of this species were not so large as my new bud stinging species.

I have, for the past three years, carefully examined the buds of *Q. ilicifolia*, hoping to find the producer of *C. q. operator* at work, but without success, till this week, when I found no less than thirty gall flies ovipositing in the buds of this oak.

That they really are the producers of these galls needs no further proof than I now give. The insect *C. q. operator* is distinguished from all our other species by the projection of the ovipositor above the dorsum. In this respect it resembles the several species of guest gall flies that infest almost all our species of galls. It has, however, the neuration of the true gall flies. In size my insects are considerably larger than *C. q. operator*, but in form, color, neuration of the wings, and, above all, in the peculiar form and position of the sheath of the ovipositor, they are like this species.

Few will doubt their identity; but to make "assurance doubly sure," I hope some one will be so fortunate as to raise gall flies from these acorn galls, when a comparison with mine will settle the question whether this particular species *(C. q. operator)* is double brooded or not.

I wish (if my article is not already too long) to state a few other facts and to show their bearing upon the history of these interesting insects.

There stands not far from my house a small oak tree, *Q. bicolor*, which is almost ruined by the ravages of a species of gall fly, which closely resemb'es and may be identical with *C. q. botatus*, Bassett. Every summer the leaves of this tree are so injured by the galls that scarcely one perfect one can be found on the tree. The petioles and midveins are enlarged to the size of one's finger, and the blade shrivels up or remains undeveloped, and each gall contains a large number of insects which come out in June. I have reared many thousands of these gall flies and find them of both sexes—about equally divided.

Late in the summer another form of gall appears, this time on the ends of the small branches, and the insects remain in these, in the imago, through the winter. I have reared not less than fifteen thousand of these gall flies and *all are females*, and they cannot be distinguished from the

summer brood except that they are a very little larger. The flies of *C. q. futilis*, O. S., are of both sexes, but among the considerable number found ovipositing in the buds of the White Oak, and which, I have no doubt, produce the galls of *C. q. futilis*, there are no males and the females are considerably larger than the summer brood.

And again, in my last discovery the flies are all females, but larger than the females of *C. q. operator*, though they have the structural peculiarities of that species.

From all the above facts I infer that all our species that are found only in the female sex are represented in another generation by both sexes, and that the two broods are, owing to seasonal differences, produced from galls that are entirely distinct from each other. I shall not be surprised if it shall yet be found that all our species of Cynips proper are double brooded, but the allied genera *Diastrophus* and *Rhodites* probably produce but one brood each year.

Mr. Walsh's successful attempts at colonizing *C. q. spongifica*, O. S., do not prove that the galls he raised were the *immediate* product of the flies he colonized; another generation may have intervened from which his galls were descended. I have in mind two species of Cynips that mature from the egg in less than thirty days. They are our earliest vernal species and are not yet described.

In an article published ten years ago in the *Proc. of Ent. Soc. of Phila.*, describing several new species of Cynips, I ventured to remark that probably some of the species whose galls are formed on the leaves deposit their eggs in the embryo leaves, the leaf buds of the following year being formed at the time these insects appear.

This seems to be true only in part. It is at another time and by another brood that the eggs are so deposited.

In the same article I gave it as my opinion that the woolly galls of *C. q. operator*, O.S. and *C. q. seminator*, Harris were the abnormal developement of the embryo leaves, and that the wool was an enormous growth of the pubescence of the leaf. To this view the late Mr. B. D. Walsh objected, either in a published article or in a letter to myself, saying the galls were not connected with the leaf buds.

Last spring I was so fortunate as to find two galls of *C. q. seminator* in the earliest stage of growth; so young that I did not recognize their true character, being simply large buds just beginning to open, but exhibiting

on the summit a beautiful rose-coloured pubescence. I watched them till they were mature and had the satisfaction of seeing them develope into two fine galls of this not very common species.

My friend, Mr. L. S. White, of this city, like a true chemist, as he is, suggested the idea of *weighing* the specimens of new insects we describe and tried his plan upon the gall flies taken the other day. The species taken on the buds of *C. q. operator* weighed 4½ millegrammes, while another species, probably *C. q. globulus*, Harris, weighed alive 18 millegrammes. This last was taken on a bud of the White Oak.

Slowly, year by year, the above and other quite as interesting fragments in the history of the Cynipidæ have come to my knowledge, and I hope to live to see their history fully written. It is in such investigations of the *habits* of insects that our real work and our highest enjoyment as Entomologists consists.

A GLIMPSE OF INSECT LIFE.

BY PROFESSOR BELL, OF BELLEVILLE.

While looking over some old memoranda a few days ago, I found the following, which may prove interesting to the readers of the ENTOMOLOGIST:

was speedily devoured, when its captor made another incursion and carried off another victim.

During the half hour that I watched their manœuvres, each one consumed one maggot and set out in search of another about once in five minutes; and as they appeared to keep this up all day until late in the evening, and perhaps all night long, the quantity of maggots destroyed must have been quite considerable. One gigantic fellow of a *humator* particularly distinguished himself in this predatory warfare, making about three incursions to two of any of the others. I captured him finally, and found him rather to exceed two inches in length.

After the lapse of a few days the maggots disappeared into the earth, there to undergo their final transformation, when the burying beetles left the place, and were succeeded by the *Silpha rugosa* and one or two of its congeners, numerous specimens of which frequented the remains for a time; and even after the softer parts had all disappeared, I took from the bones several individuals of two or three species of *Nitidula*.

I never observed the *Necrophorus mortuorum* near the carcass of the dog, though within half a mile, in the pine woods of Ewart Park, it was very numerous on the bodies of crows and other carrion birds which had been shot and left lying by the gamekeeper; and though I took several specimens of *N. vespillo*, and of another nearly allied species of which I do not remember the name, in comparing with the *N. mortuorum*, I never met with a single individual of the *N. humator* or the *Necrodes littoralis* in the pine woods.

THE question has often been debated whether flies eat the pollen of plants, or merely carry it away accidentally on their legs and backs. The question would appear to be set at rest by a paper read at the last meeting of the Scientific Committee of the Royal Horticultural Society by Mr. A. W. Bennett, in which it is stated, as the result both of his own observations and of those of Erm. Muller, that the microscopic examination of the stomachs of Diptera belonging to the order Syrphidæ, shows them to contain large quantities of pollen-grains, especially of plants belonging to the order Compositæ. Entomologists had expressed a doubt as to whether it were possible for insects possessed only of a suctorial proboscis to devour such solid bodies as pollen-grains; but Muller believes that the transverse denticulations found in the valves at the end of the proboscis of many Diptera are especially adapted for chewing the pollen-grains, and for dividing the threads by which the grains are often bound together.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Vol. 4, Page 235.)

FAMILY GALERUCIDÆ.

292. GALERUCA OLIVIERI *Kirby.*—Length of body 3¼ lines. Taken in Canada by Dr. Bigsby.

Very near related to *Galeruca quadrimaculata* F. Body long, glossy, reddish-yellow: posterior part of the head black, a cross impressed between the eyes; antennae dusky with the four first joints rufescent: prothorax impunctured, transversely subimpressed behind, sides margined: elytra very minutely and lightly punctured with punctures just visible under a good lens; at the base of each elytrum nearest the suture is a roundish black spot, and another large oblong one extends from above the middle towards the apex; posterior thighs a little incrassated; tarsi dusky, especially at the apex; medipectus and postpectus black.

[Synonymous with *Phyllobrotica decorata* Say. Taken in "Canada, Lake Superior, Illinois; rare. In the ♂ the 5th ventral segment is very large, canaliculate, deeply excavated behind, with a small testaceous triangular appendage projecting over the 6th segment. The disc of the thorax is not impressed." Le Conte.]

[219.] 293. GALERUCA CANADENSIS *Kirby.*—Length of body 4 lines. Taken in Canada by Dr. Bigsby.

Body elongate, hairy with short decumbent cinereous hairs or down, dirty-rufous, underneath black. Head with a black vertical spot; six last joints of the antennae black, the others, except the scape, rufous black at the tip; scape rufous, black above; prothorax transversely impressed, sides posteriorly oblique with a slight sinus; three equidistant irregular black spots or dots placed transversely on the disk; the two elytra taken together have three black stripes, the intermediate or sutural one being common to both, and converging with the lateral ones at the tip; anus obscurely rufous.

[Belongs to Le Conte's genus *Trichabda*. "A common species extending from Lake Superior and the Mississippi Valley to the Pacific." Le Conte.]

294. GALERUCA SAGITTARIÆ *Gyll.*—Length of body 2¾ lines. Several specimens taken in Lat. 54°. Taken also by Dr. Bigsby in Canada.

Body brown, a little downy, not glossy. Mouth dirty-yellow; prothorax transverse, impressed, reddish-yellow, with three black nearly confluent spots; scutellum subquadrangular, truncated at the apex; elytra grossly but not thickly punctured; suture and lateral margin paler than the rest of the elytrum; anus and legs reddish-yellow; tarsi darker.

VARIETY B. With the base of the antennae yellowish underneath, the black spots on the prothorax distinct, and the elytra entirely of a brownish yellow.

["Found throughout the middle and northern parts of the Atlantic district." Le Conte.]

[220.] 295. GALERUCA BILINEATA *Kirby.*—Length of body 2 lines. A single specimen taken in Lat. 54°.

Nearly related to the preceding species, but smaller, the whole of the head is rufous, the joints of the antennae are shorter; the prothorax is longer in proportion to its width; and the elytra, nearer the suture than the lateral margin, have two somewhat elevated approximated blackish ridges, the interior one being the shortest and extending from near the middle to the base, and the other reaching neither base nor apex.

[Considered by Le Conte as probably a specimen of *G. notulata* Fab., with indistinct markings.]

296. GALERUCA MARGINELLA *Kirby.*—Length of body 3 lines. A single specimen taken in Lat. 65°.

Body very black, a little downy. Mouth and base of the first joint of the antennae subtestaceous or reddish-yellow; prothorax wider than long, impressed and confluently punctured on each side, with a longitudinal dorsal channel; behind the margin has a slight sinus; reddish-yellow with three black spots, the intermediate one being the smallest; elytra grossly and thickly punctured; lateral margin and apex reddish-yellow; legs dusky-yellow; last ventral segment of the abdomen yellow and deeply emarginate.

[Le Conte refers a specimen from Fort Simpson, Hudson's Bay Territory, to this species.]

[221.] FAMILY SAGRIDÆ.

297. ORSODACNA TIBIALIS *Kirby*.—Length of body 2¾ lines. A single specimen taken in the journey from New York to Cumberland-house.

Body piceous; underneath hoary with decumbent hairs; above naked, glossy, thickly punctured. Palpi and two last joints of the antennae obscurely rufous; front between the eyes with a transverse levigated elevation; prothorax longer than wide, constricted at the base; lateral margin and epipleurae or side-covers of the elytra, except at the base, yellowish-red; thighs, at the base, and tibiae reddish-yellow, the four posterior tibiae darker at the apex.

[Taken at Lake Superior by Agassiz's Expedition.]

298. ORSODACNA CHILDRENI *Kirby*.—Plate vii, fig. 6. Length of body 2¾ lines. A single specimen taken in Lat. 54°.

[222.] Body above punctured, naked. Head and its organs yellow, with the eyes, occiput, and apex of the mandibles black; a levigated transverse elevation of the front, as in the preceding species; prothorax longer than wide, constricted at the base, with an impression in the middle, pale-yellow, disk embrowned; scutellum rufous; elytra rather paler than the prothorax, with a stripe adjoining the lateral margin, an angular band beyond the middle and the base, black; antepectus, anus, and legs, yellow, rest of the underside of the body is black, and hoary with decumbent white hairs.

[Taken in Canada.]

FAMILY DONACIADÆ.

299. HÆMONIA NIGRICORNIS *Kirby*.—Length of body 3⅓ lines. Taken in Canada by Dr. Bigsby.

This species is considerably larger than *H. Equiseti* and *Zosteræ*, from which it is perfectly distinct. Body luteous above and glossy; underneath it is covered with a thick coat of pale, decumbent, rather silky hairs, with somewhat of a golden splendor, if these are rubbed off, the colour of the breast and basal abdominal segment is black. Head hairy, dusky, with a levigated naked testaceous longitudinal elevation between the eyes; antennae black, robust, very little longer than the prothorax; prothorax

subquadrangular with prominent anterior and posterior angles making it appear constricted in the middle, it is channelled with an irregular discoidal impression on each side; a few large dusky punctures are observable where the channel terminates; elytra with ten equidistant rows of large punctures which converge at the apex; besides these there is an abbreviated row at the base next the suture, as in many *Harpalidæ*, &c., the apex of the elytra terminates in two teeth or spines; the inner one short and dentiform, the outer one long and spiniform; legs and anal portion of the abdomen yellow, the former with all their articulations dusky at the extremity.

The sculpture of the elytra in this species much resembles that of another aquatic genus *Haliplus*, Lat.

ON SOME OF OUR COMMON INSECTS.

5. *THE GRAPE VINE PLUME.—Pterophorus periscelidactylus.*

BY W. SAUNDERS, LONDON, ONTARIO.

During the latter part of this month and early in June those who have grape vines under their charge are often annoyed at finding the terminal leaves of the young and tender branches tied by means of silken threads into a sort of ball shaped mass, and within the hollow sphere thus formed is found a small whitish hairy caterpillar, which feasts on the tender leaves and young blossom bunches. Usually but a single occupant is found in each enclosure, but occasionally we have found two, and, in one instance, three.

Fig. 15.

The very young larva is said to be smooth, or nearly so, the hairiness becoming more perceptible after each moult.

In fig. 15 this larva is represented nearly full grown at *a*. It is then about half an inch long with a small yellowish green head, with a band of black across the front, and a yellowish green body, with transverse rows of dull yellow tubercles from each of which arises a small tuft of white

hairs. There is a darker green line down the centre of the back, and the colour of the body becomes a little paler between the segments or rings. The under side is somewhat darker in color than the upper, with a few whitish hairs. It becomes full grown about the middle of June, and then changes to a chrysalis.

The chrysalis, fig. 15, *b*, is a very odd looking thing, nearly half an inch long, angular and rugged in outline. It wriggles and twists about very briskly when touched. At first it is of a pale yellowish green colour, which gradually changes to a reddish brown. We have often found them attached to the under side of the leaves.

In less than a fortnight the moth, *d*, fig. 15, makes its appearance. It is an elegant little creature; its wings are very delicately constructed and measure, when expanded, about seven-tenths of an inch. The fore wings are long and narrow and cleft down the middle about half way to their base, the posterior half of the wing having a notch in the outer margin. They are of a yellowish brown colour and metallic lustre, with several dull whitish streaks and spots. The hind wings are divided into three lobes; the lower division is complete, extending to the base, while the upper one is only about two-thirds as deep; their colour is yellowish brown also, with the same burnished metallic appearance, and with a streak of dull white on the hinder lobe. The outer and hind margins of the wings, as well as all the edges of their lobes, are beautifully bordered with a deep whitish fringe, sprinkled with brown. The body of the moth is long and slender, and of a little darker colour than the wings; the legs are also long, banded alternately with yellowish brown and white, and powdered with metallic scales. The unnatural grouping of the leaves when fastened together to form the home of this insect while in the larval state, leads to its ready detection, when it may be easily crushed with the hand. It is very generally distributed throughout the provinces of Ontario and Quebec.

ADVERTISEMENTS.

EXCHANGE.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. WASSERMAN, Beverly Terrace, Cullercoats, North Shields, England.

COLEOPTERA FOR SALE.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by JOHN AKHURST, 19, Prospect Street Brooklyn, N. Y.

TO CORRESPONDENTS.

J. C. WASSERMAN.—Plusia balluca is very like P. chrysitis. We know the latter insect well.

The Canadian Entomologist.

VOL. V. LONDON, ONT., JUNE, 1873. No. 6

ON SOME OF OUR COMMON INSECTS.

6. *THE RASPBERRY SAW-FLY—Selandria rubi*, Harris.

BY W. SAUNDERS, LONDON, ONTARIO.

Although this insect is quite generally distributed and very destructive to the foliage of the raspberry, it has, strange to say, been but little noticed by Entomologists in their publications. There is a short reference to it in "Harris' Entomological Correspondence," in a letter from Darling to Harris, written in 1846, where a very correct account is given of the manner in which the egg is deposited. There is also a much briefer notice in "Packard's Guide," and these are all the references we have been able to find.

The perfect insect, which is a four-winged fly, appears on the wing about the middle of May. We noticed them this year first on the 10th, last season they were not observed until the 21st, and they may be found from this time until early in June. The wings, which are transparent, with a shining surface and metallic hue, measure when expanded about half an inch across; the veins are black with a streak of black along the front margin, extending more than half way towards the tip. The anterior part of the body is black, the abdomen dark reddish. In common with some other species of *Selandria*, these flies have a habit of falling to the ground when disturbed, especially in the cool of the morning, and remaining in this position long enough to enable one to catch them; with the increasing heat of the day they are, however, much more active, and take wing readily when approached.

The egg, as it appears when squeezed from the body of the female, is about one-thirtieth of an inch long, and a little over one-hundredth of an inch wide at its widest portion. In form it approaches a long oval, rather

obtuse at the ends, with its greatest diameter a little before the middle. Colour white, with a faint yellow tinge and a smooth, glossy surface, semi-transparent. The enveloping membrane is very thin and easily ruptured, discharging watery looking contents. Only seven or eight eggs were obtained from the body of the female examined; possibly it might have previously deposited most of its stock. The eggs are buried beneath the skin of the leaf, close alongside of the ribs and veins, placed there by means of the saw-like apparatus with which the female is provided, where it swells somewhat and produces a slight discoloration of the cuticle on the upper surface. The skin covering the under surface of the swelling is so thin and semi-transparent that the movements of the larva may be observed a day or two before hatching, by the black spots on the side of the head showing through. The larva escapes through an irregular hole made on one side of the swelling.

The young larva as it appears when fresh from the egg. Length, when in motion, about one-twelfth of an inch. Head large, semi-transparent, greenish-white, with a large black eye-like spot on each side and with a number of short whitish hairs; mandibles pale brown.

The body above is nearly white, semi-transparent, and thickly covered with transverse rows of white spines, nearly all of which are forked towards the tip; some of the spines on the anterior segments are more compound, having four or five branches; the tips of all the branches of the spines are blunt, nearly rounded. The under surface is similar to the upper in colour and semi-transparency, feet and prolegs partake of the general colour.

After the first moult the head is medium sized as compared with the body, of a pale yellowish green, covered with short fleshy looking hairs of the same colour. The body above is of a uniform pale greenish-yellow colour, excepting along the dorsal region, where, owing to the transparency of the skin, the internal organs show through of a deeper shade of green. The surface of the body is thickly set with short greenish-yellow tubercles, most of which are forked at the tips, the two branches spreading in opposite directions, the greater portion of them extending anteriorly and posteriorly. Out of three specimens of this age examined, one varied from the others in having a pale brownish-yellow head. The under surface, feet and prolegs all pale greenish-yellow.

With the subsequent moultings slight changes take place in the colour of the head, first pale brownish or greenish-brown, then bluish-green, and

sometimes the branches of the spines assume a brownish tint, especially on the anterior segments.

When full grown this larva measures a little over half an inch; it is nearly cylindrical, tapering slightly towards the hinder segments.

The head is rather small, nearly globular, pale green with a faint yellowish tinge, and a dark brown dot on each side, and a few very fine short hairs visible only with a strong magnifier. The mandibles are tipped with brown.

The body above is dark green, thickly set with green tubercles, from which proceed fleshy looking, forked, pale green, hair-like branches, most of them with their branches extending anteriorly and posteriorly On the anterior part of the second segment there is a row of four spines with five branches each, most of the others are forked, but some few of them have three branches each. There are eight spines or tubercles on most of the segments, arranged more or less perfectly in a double transverse row. In some specimens the hair-like branches or appendages are black at the tips, and occasionally entirely black from the point of divergence.

The under surface is similar to the upper; feet and prolegs green.

When mature—from the middle to the latter end of June—these larvæ penetrate below the surface of the ground, where they construct little oval earthy cocoons, formed by glueing together particles of earth with silky and glutinous matter. These cocoons are toughly made, and may be taken out of the earth in which they are embedded and even handled roughly without much danger of dislodging the larvae. The specimens which we have bred, when examined a week or two after the cocoons were constructed, were still in the larval condition, although somewhat contracted in length. They all dried up and died before changing to pupae, so we are as yet unable to indicate when this change takes place, the appearance of the chrysalis or its duration. As we have not met with more than one brood in the season, it is probable that the larvae remain in the ground for some weeks unchanged, gradually transform to pupae and remain under ground in this condition until early the following spring.

SCIENTIFIC PUBLICATIONS.

BY THE EDITOR.

From both sides of the Atlantic we continue to receive a continuous and ever-welcome stream of serial publications, on various scientific subjects. In all of those devoted to general Natural History our favorite department of Entomology receives its due share of attention, while there has been no recent diminution in the number of publications specially devoted to this branch of Zoology. To Practical Entomology we find more and more space and attention directed, year by year, in the leading agricultural magazines and newspapers; few, indeed, of the latter are now considered complete without the regular contributions of an Entomological Editor. The various State Entomologists continue, too, to afford us their annual Reports, filled with great stores of most valuable information, not only for the farmer and gardener, but for the student of nature as well.

As we have not for some time directed the attention of our readers to the scientific serials that we are constantly receiving, we propose to devote rather more space than usual in this issue to the enumeration of the principal papers that are of interest to the Entomologist. We take the opportunity also of returning our grateful thanks to the Authors, Editors and Publishers who, month by month, and year by year, favour us with their much valued productions.

To turn to the old world first.—No more welcome visitor comes to our table than the weekly numbers of *Nature* (London: Macmillan & Co.) This most interesting publication has now entered upon its eighth half-yearly volume, and is evidently thoroughly well established in public estimation. Recent numbers contain numerous articles and letters by leading men of science on the much vexed subject of Instinct and Perception in Animals. During the last month there have also appeared the first two of a series of illustrated articles by Sir John Lubbock on "The Origin and Metamorphoses of Insects," and a paper by Mr. A. Murray on "Venomous Caterpillars."

Science Gossip (London: Hardwicke) is replete with matter of a lively and popular character. During many months past there have been published in its pages a useful series of articles on "Collecting and

Preserving" objects of Natural History in all departments. No. 101, for May, 1873, is now before us; it opens with an illustrated account of the plant-crystals, Raphides, &c., by Prof. Gulliver; then follows "Notes on Collecting and Preserving Land and Fresh-Water Shells;" "Records of Rare Plants," the "Origin and Distribution of the Insects of the British Isles," "Comparative Size of Animal Hairs," 'Gossip' on Microscopy, Zoology, Botany, Geology, &c.

The Scottish Naturalist (Perth, Scotland) is an excellent quarterly magazine of Zoology and Phytology, published by the Perthshire Society of Natural History. With the number for January last the second volume was commenced, and the size of the publication enlarged from 32 to 48 pages—a notable sign of progress. Among the articles of interest in the last two numbers we may mention that on "The Occurrence of the Hooded Seal at St. Andrews," by Mr. R. Walker; "Memoirs on Scottish Tenthredinidæ," with a beautiful colored plate of *Nematus gallicola*, by Mr. P. Cameron, jun.; a paper by the Editor (Dr. F. Buchanan White) on the extraordinary occurrence of *Vanessa antiopa* in Great Britain last year; papers on Scottish Diptera, Spiders, Tortrices, Galls, &c., by various authors; an article on "Polarity in the Geological Distribution of Genera," by the Rev. J. Wardrop; and instalments of an excellent "Insecta Scotia"—Lepidoptera and Coleoptera. We heartily wish the publication the fullest success.

Newman's Entomologist (London: Simpkin, Marshall & Co.) and *Zoologist* (Van Voorst)—for which we are indebted to our friend Mr. Reeks—continue to maintain their respective characters: the former as a recorder of captures, varieties, 'exchanges,' &c.; the latter chiefly as an Ornithological magazine, though singularly enough, we always find in it the fullest and best reports of the meetings of the Entomological Society of London.

The Entomologist's Monthly Magazine (London: Van Voorst) appears to us to be better maintained and of more general interest than formerly.

From the authors we have received *Notes on Chalcidiæ* (Parts i to vii), by Francis Walker, Esq.; *Note on a Chinese Artichoke Gall*, by Albert Muller, Esq. (from the Linnean Society's Journal); and two papers *On Modern Glacial Action in Canada*, by the Rev. W. Bleasdell (from the Quarterly Journal of the Geological Society).

Turning to this side of the Atlantic, we may notice first the *Proceedings and Transactions of the Nova Scotian Institute of Natural Science* (Part ii.,

vol. iii). The number opens with the conclusion of Mr. J. M. Jones' paper on "Nova Scotian Lepidoptera;" among the other articles we would especially mention "The Mammalia of Nova Scotia," by Dr. Gilpin, "On Parallel Lines of Elevation in the Earth's Crust," by Mr. A. Ross, and "The Human Teeth," by Dr. A. C. Cogswell.

The *Proceedings of the Boston Society of Natural History* (vol. xv., part i., Jan.—April, 1872), are chiefly occupied with an able geological article by Mr. John B. Perry, on the "Post-Tertiary History of New England."

The Annals of the Lyceum of Natural History of New York (vol. ix and vol. x, Nos. 1–7) contain, amongst a large number of able papers on all branches of Natural Science, two portions of the late Mr. Coleman Robinson's "Lepidopterological Miscellanies." The *Proceedings* of the same Society from April, 1870 to April, 1871, contain a number of short interesting articles, among which we notice a large proportion on Microscopy, by our friend Prof. A. M. Edwards.

The *Proceedings of the Academy of Natural Science of Philadelphia* (parts ii and iii, May—Dec., 1872) contain but one short article that bears any reference to Entomology—"On the Agency of Insects in Obstructing Evolution," by Mr. Thos. Meehan.

The American Naturalist (Salem, Mass.), vol. vii, Nos. 1—4. This excellent publication is maintained with undiminished vigour by its energetic proprietors, Profs. Packard & Putnam. The numbers of the current volume now before us contain the following articles on Insects:—"Harvest Mites," by Prof. Riley; "Controlling Sex in Butterflies," by Mrs. Mary Treat, in which the authoress is unkind enough to suggest that male butterflies are produced only from half-starved larvæ, the full fed specimens producing females!—this new phase of 'women's rights,' though based upon experiments, we cannot but regard as a fortuitous coincidence in the cases referred to, and by no means a law of nature; "A Viviparous Fly," by Rev. S. Lockwood; and "The Cotton Caterpillar," by Mr. L. A. Dodge.

The Bulletin of the Buffalo Society of Natural Sciences—vol. i, No. 1, April, 1873—is a new addition to the list of scientific serials, and one that we trust will be warmly supported by all naturalists throughout America. It is to be published quarterly, in octavo form, thirty-two pages at least forming a number. The copy before us contains four valuable articles, all

from the pen of Mr. Aug. R. Grote, viz.: 'Descriptions of new North American Moths,' illustrated with a plate; 'Catalogue of the Sphingidæ of North America,' 'Catalogue of the Zygænidæ of North America,' and 'Conclusions drawn from a Study of the Genera Hypena and Herminia.' This list of contents will, we trust, be sufficient to cause our Entomological friends to send for the publication, and thus aid its permanent establishment.

Monthly Report of the Department of Agriculture (Washington, D. C., April, 1873). The "Entomological Record" in this number contains an illustrated paper by Prof. Townend Glover, on the Tobacco and Potato worms (*Macrosila Carolina* and *quinque-maculata*).

The Canadian Journal (Canadian Institute, Toronto, May, 1873) and *The Canadian Naturalist* (Montreal: Dawson Brothers, vol. vii, No. 1) maintain their respective characters as literary and scientific periodicals.

The Canada Farmer (Toronto, vol. x, No. 9—May 15, 1873) is now issued fortnightly instead of monthly, and is much improved both in form and matter.

The Canadian Patent Office Record and Mechanics' Magazine (Montreal: G. E. Desbarats) is a new and attractive candidate for public favour. The first number, now before us, is profusely and handsomely illustrated; it consists of two parts, the official portion giving a record of inventions patented at Ottawa during the preceding month, with illustrations of the majority—the present issue contains no less than 237 diagrams; and the unofficial or magazine paper affording elaborately illustrated articles on Engineering, Mechanics, Manufactures, &c. The work is well got up and deserves to become a great success.

Our limited space forbids our doing more at present than briefly acknowledging with thanks the receipt of the following publications:—*The American Agriculturist; The Horticulturist; The Weekly Sun*, and the *Rural New Yorker*, from New York; *The Prairie Farmer*, Chicago; *The Maine Farmer*, Augusta, Me.; *The North Western Farmer*, Indianapolis; *The Journal of Education*, Toronto; *Geological Survey of Canada*, Report of Progress for 1870—'71, and *The Statutes of Canada*, 1872, from the Department at Ottawa; *The Canadian Almanac*, 1873, Copp & Clark, Toronto; *Catalogue of the Birds of Canada*, by Dr. A. M. Ross, Toronto; *Directions for Collecting Coleoptera*, and a *Catalogue* of species of the order, by Geo. Dimmock, Springfield, Mass. The Reports of State Entomologists, now being issued, we hope to notice in our next number.

OUR SPECIFIC NOMENCLATURE.

BY THEODORE L. MEAD, NEW YORK.

In the article published in the April number on the subject of nomenclature, it is stated that Mr. Scudder, in his Revision, has followed the same principles which govern all other departments of Zoology. It would be interesting to know what these universally adopted principles may be, for, judging from the recent publications on the subject, they must be yet unknown to a great number of those eminent in science. Mr. Wallace, than whom we have no higher entomological authority, in his address to the London Ent. Soc., recommends English naturalists to follow the British Association rules until others may be assented to, while these same rules find scant acceptance in Germany or France.

In regard to species having been described, not by naturalists but by amateurs, this may be conceded in Hubner's case, but the term will hardly apply to Linnæus and Fabricius and the other authors whose species are the cause of most dispute.

Mr. Kirby's Catalogue is said to combine the results of the labor of European students, but Dr. Staudinger's elaborate and conscientious Catalogue no less had the benefit of all these investigations, with the result of hopeless variance as far as both works cover the same ground, and that too when the principles of nomenclature adopted by either author are almost identical with each other and with those which Mr. Scudder apparently follows. In the group of insects best known and most studied, the British Diurnals, these two authors differ as to the specific names of one seventh of the entire number. This is the result of rigidly following the law of priority, which *should* at once and forever decide every possible case of synonymy. That does not seem encouraging, for both authors in nearly all cases make the references to the same obsolete and unrecognizable descriptions.

The rule of absolute priority, adopted as paramount law by a few investigators, has already brought about such a state of things as this, and alone is capable of continuing it.

Let the first law be stability of already accepted names, then the law of priority takes its proper subordinate place to decide between names in use. Rather than the term "law of convenience," used by the opponents of this rule, though it is suggestive and to some extent appropriate, I would propose the name "*Law of Stability*" as most applicable.

All nomenclature is but a means to the end of increasing our knowledge of the organisms themselves, and for this, unchangeability of names is the first requisite. Whatever the strict law of priority theoretically should accomplish, we have seen but the beginning of the permanent confusion in which its practice results, and which its continuance as the fundamental law will hand down to the remotest generation ; each inexact description, as published, adding new material to increase the complexity of the tangled web of names.

NOTES ON HYPERCHIRIA IO (FABR.)

BY C. V. RILEY, ST. LOUIS, MO.

I have obtained many egg-masses of this species the present season and have had them deposited by moths reared in confinement. Even in a state of nature they are deposited quite irregularly, some fastened on one of the compressed sides, some piled on top of others, but most of them on the small end as in the closely allied *Maia*. The average length is 0.07, largest width 0.05, and greatest thickness 0.03 inch. They are compressed on two sides, and flattened at the apex, the attached end smallest. When first deposited they are pure cream color, with a translucent yellow spot on the flattened apex. Toward maturity the colour changes to a more intense white with a faint lilaceous tint; the yellow spot at apex becomes mostly black and the compressed sides are more or less translucent, especially the upper half, through which the yellow of the enclosed larva and some of the darker spines may easily be seen just before the hatching period. Mr. Lintner's description as "elliptical, somewhat flattened," and Mr. Minot's "top-shaped" are neither, strictly true, and would hardly enable one to distinguish this egg from many others; while my own description is not as ample as it should be. Hence these notes. The larval changes are given in my 5th Report (p. 135.) The spines of the larva in the first stage are too weak and pliant to enter the most tender skin ; and the urticating property is only ascertainable after the first moult.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 91.

ERRATA.—For *T. eunitaræella, ante* p. 85, read *T. cæmeteriiella.*

PITYS.

(This is a section of *Tinea* having the wings tufted and narrower than in *Tinea.*)

Head and face rough (as in *Tinea*), tongue very short. Maxillary palpi folded; labial palpi drooping, with the terminal joint more than half as long as the second, which has a few bristles beneath; eyes globose; no ocelli. Antennae two-thirds as long as wings, filliform. Anterior wings with raised tufts of scales, the tufts generally rather brightly coloured; lanceolate, narrower than in *Tinea;* the costal vein attains the margin before the middle; discal cell closed by a straight distinct discal vein, which gives off four branches, two of them to the costal and two to the dorsal margin, one of the latter near the apex. The subcostal attains the costal margin, giving off a long branch before the middle and a shorter one near the end of the cell; the median is three branched, the two last arising together from the end of the cell; submedian simple, fold thickened at the end.

Posterior wings linear, lanceolate; costa excised from the middle to the tip? the costal vein attains the margin about the middle; the subcostal is straight to the margin before the apex; the cell is closed by a curved discal vein which gives off two branches, one to the apex, the other below it; the median vein is three branched, the terminal one having a common origin with the lower discal branch; the two others arise from the apical half of the cell. Ciliae long; submedian and internal obsolete.

1. P. auricristatella. N. sp.

Pale gray, with intermixed brown scales. Head hoary; a small scattered patch of raised golden scales within the costal margin near the

base, and a similar one opposite near the dorsal margin ; another large one just before the middle, another small one within the costal margin behind the middle, and a fascia of raised golden scales before the ciliae ; a few scattered golden scales in the apical portion behind the fascia. *Al. ex.* over ¼ inch. Kentucky.

2. *P. fusco-cristatella. N. sp.*

Head and palpi sordid yellowish-gray ; antennae pale fuscous ; thorax brown above, with a brown patch on each side under the base of the wings ; basal three-fourths of the anterior wings sordid white, yellowish, and brown scales intermixed, the apical fourth fulvous and separated by a distinct line, which is convex towards the apex. An obscure cloudy spot near the base of the wing ; at about the basal third are two dark brown patches of raised scales, one of which is on the disc, the other within the dorsal margin ; about the apical third are two similar tufts similarly situated. About six small white costal streaks on the apical half of the costa. *Alar ex.* ¾ inch. Kentucky.

3. *P. fasciella. N. sp.*

Grayish fuscous, overlaid with golden yellow. Anterior wings with a narrow brown border along both margins ; a tuft of silver gray raised scales on the disc at about the basal third, and another opposite within the dorsal margin ; a row of small oblique silvery streaks along the costal margin ; just before the ciliae is a narrow fascia of raised silver gray scales, behind which, near the apex, are two indistinct narrow white fasciae not raised, the first of which is especially indistinct. In the brown dorso-apical margin are about eight small white spots. Ciliae gray. There is a brown patch on each side of the thorax just underneath the base of the wings ; thorax brown ; vertex brownish-red ; antennae pale fuscous ; palpi and face white, the second palpal joint white without. *Alar ex.* ½ inch. Kentucky.

In the general color of the wings and the costal markings this species seems somewhat to resemble *Homosetia costisignella* Clem. The genus also resembles *Homosetia* as described by Clemens, in the palpi and neuration, but differs somewhat in these respects, and *Homosetia* has no raised tufts.

4. *P. misce-cristatella. N. sp.*

Palpi whitish, the labial pair externally fuscous ; lower part of the face white, upper part and vertex sordid gray ; antennae pale fuscous ;

thorax grayish fuscous; primaries whitish, sparsely dusted with golden brown scales and with three or four transverse patches of golden brown; about the basal fourth, in one of the golden brown patches, are two small spots of yellow scarcely raised scales opposite to each other and just within the margins, the dorsal one being the smallest. (In one specimen in place of the dorsal yellow spot is a distinct patch of brown raised scales.) In another of the transverse patches, about the middle, is another larger spot of yellow scarcely raised scales, with a small opposite dorsal patch of raised scales, and in another transverse fuscous patch, about the beginning of the ciliae, is another transverse patch or streak of whitish and brown scales with a few yellow ones intermixed. Costal margin brownish, with seven white streaks, the first three pointing a little obliquely backwards, and the last four, which are in the apical part of the wing, nearly straight or a little oblique forwards; the last two cross the wing and are concave—especially the last one—towards the apex. The brownish portions of the wing with golden reflections in some lights. *Al ex.* 3/8 inch. Kentucky.

The specimen above mentioned in parenthesis has the apex of the wings a little worn and I cannot distinguish the costal streaks in that part of the wing. Possibly it may be a distinct species, but I think not.

The foregoing sub-genus is allied to *Tinea* both in the trophi and the neuration of the wings. Nevertheless, it differs decidedly from that genus in the neuration. In the neuration of the wings and their tufts of raised scales it is allied to *Xylesthia*, but differs decidedly from it in the trophi; and the antennae differ decidedly by their increased length. In this respect and in the neuration and palpi it approaches nearer to Clemens' sub-genus (of *Tinea*) *Homosetia*, but that sub-genus has no raised tufts upon the wings, and the neuration is not exactly the same.

CYANE, *gen. nov.*

This genus is very near to *Tinea*, the principal differences being in the form and neuration of the hind wings (in which respects different species of *Tinea* by no means agree with each other), in the absence of bristles on the palpi, and the ciliated antennae. The general appearance of the insect in repose is that of a *Gelechia*, and such I supposed it to be when it was captured. It also approaches that group in the form and neuration of the hind wings.

Primaries lanceolate, ovate : the costal vein attains the margin about the middle ; discal cell wide and closed ; the subcostal is obsolete towards the base, and sends a long branch from near the base to the margin behind the cell, two shorter branches from near the end of the cell, and then proceeds to the costal margin before the apex ; the median sends one branch from near the end of the cell to the closed margin, and then proceeds from the end of the cell to the dorsal margin ; the discal gives off four branches, one to the costal margin near the apex and three to the dorsal margin. Submedian simple.

Secondaries a little wider than the primaries, with the costal margin very faintly excised from the base to near the middle, and slightly arched thence to the apex. Posterior much and regularly curved and apex rounded. The costal vein is close to the margin, but only attains it in the apical fourth of the wing. Subcostal obsolete towards the base, nearly straight and attaining the costal margin just before the apex ; discal cell wide and closed : the discal vein gives off two branches to the dorsal margin : the median sends from about the middle of the wing a curved branch to the dorsal margin and proceeds to the end of the cell and thence to the dorsal margin : submedian and internal veins distinct and simple.

Head roughened (as in *Tinea*). Antennae little more than half as long as the primaries, tapering from the base to a point at the apex, with a distinct shoal of ciliae on each joint. Tongue ? (concealed by the maxillary palpi, which are folded) ; labial palpi drooping in the dead insect (or perhaps more properly called incurved), without bristles, long enough to reach the eyes if recurved (as I think they are in the living insect), with the second joint as long as the first and third united, the third vertically compressed and with the scales roughened. Eyes, globose, moderate; ocelli none.

C. visaliella. N. sp.

Maxillary palpi white ; labial palpi white, outer surface of the second joint, except at the apex, and a spot on the outer surface of the third joint brownish ; head whitish gray with some brown scales intermixed ; antennae with alternate white and brown annulations ; thorax and primaries pale or whitish gray, sparsely dusted with brown, a small brown spot on the base of the costa, a smaller one about the basal fourth, and a very large one just behind the middle touching the costa and crossing the fold ; apical portion of the wing brownish, with some whitish and gray

scales intermixed, and with two small oblique costal white streaks just behind the large brown spot; costal ciliae dark brown, dorsal ciliae grayish. *Alar ex.* 3/8 inch. Several specimens captured in June resting on forest trees, at Visalia, Kentucky.

CLYMENE, *gen. nov.*

Clothed with longish hair-like scales, those of the head and face roughened, standing out in every direction, many of those of the anterior wings also standing out (or rather reversed, suggesting a resemblance to the breed of chickens with reversed feathers).

No tongue; labial palpi short; maxillary palpi long, three jointed, the second and third joints sub-equal, drooping together or sometimes folded in the dead insect (folded in the living?). Antennae more than half as long as the wings, hairy, somewhat roughened in the living insect, carried projecting together straight in front; eyes small, not visible from above.

Forewings lanceolate; there is a long semi-opaque space on the costal margin; discal cell unclosed; costal vein short; subcostal nearly straight, passing to the apex, giving off to the costal margin four branches, the first from about the basal fourth, the second and longest from just before the middle and attaining the margin just before the other two, which are given off in the apical part of the wing; the median passes nearly straight to the dorsal margin behind the apex, from about the basal fourth it gives off a long branch which attains the margin just behind the vein itself, which is trifurcate in the apical part of the wing; fold very distinct; submedian furcate at base.

Posterior wings lanceolate; costal vein almost coincident with the margin; subcostal straight to the apex, sending to the costal margin two short branches, the first behind the middle, the second in the apical portion; median vein nearly straight to the dorsal margin behind the apex, sending to the dorsal margin two branches, one not far from the base, the other about the middle; submedian distinct. Ciliae moderate.

The imago is very shy and active, running very rapidly till it finds a place of concealment, and taking flight easily. The larva of the species described below is unknown; the imago is abundant in May and June upon the trunks of Beech trees.

C. ægerfasciella. N. sp.

Head luteous with intermixed dark brown scales; palpi dark grayish fuscous; legs and body sordid luteous; antennae sordid luteous, mixed

with dark grayish fuscous: thorax and anterior wings dark purplish brown with a faint whitish spot on the dorsal margin near the base, a faint narrow whitish fascia about the middle, and a faint whitish costal and similar dorsal spot opposite, just before the ciliae, and another similar spot at the apex; these spots are all very indistinct. Ciliae fuscous. Posterior wings grayish fuscous. The ends of the fascia on each margin are visible as whitish spots in the wing itself after it is denuded. *Alar. ex.* ¼ inch. (The wings are much longer than the body.) Kentucky.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 90.)

[223.] 300. DONACIA FEMORALIS *Kirby.*—Length of body 3¼ lines. Taken in Nova Scotia by Dr. MacCulloch.

Body bronzed, gilded, with a greenish tint, very minutely and thickly punctured, not conspicuously hairy underneath. Frontal channel slight; antennae, except the scape which is bronzed, and mouth rufous; prothorax with an impression above the scutellum; anterior tubercles more than usually prominent; scutellum rather large; elytra with single slight anterior impression adjoining the suture; legs rufous, but the thighs, which are much incrassated, except the base and summit, are green-bronzed; posterior thigh without any tooth; abdomen as in the preceding species.

This species seems nearly related to *Donacia pusilla* Say.

301. DONACIA FLAVIPES *Kirby.*—Length of body 4 lines. A single specimen taken in Lat. 65°.

Body bronzed-copper with a golden lustre; clothed below with very short, somewhat silvery, decumbent hairs, the metallic splendor of the body being visible through them. Head thickly, minutely, and confluently punctured or wrinkled, channelled between the eyes; antennae testaceous, longer than the prothorax; prothorax subquadrangular, longer than usual in the genus, widely channelled, very minutely, thickly, and

confluently punctured and wrinkled; anterior tubercles large and not prominent; elytra with two impressions adjoining the suture, elevated at the base; legs testaceous.

[Taken in Ontario and at Lake Superior].

302. DONACIA AFFINIS *Kirby*.—Length of body 3¾ lines. Taken by Dr. MacCulloch in Nova Scotia.

Body minutely punctured, copper-coloured brilliant with the splendor of gold; underneath very slightly hairy, Head channelled between the eyes; antennae and mouth testaceous; prothorax widest anteriorly, channelled, punctured but not thickly, lateral anterior tubercles levigated; scutellum small; elytra with a single impression, not far from the base, adjoining the suture; base elevated; margin of the ventral segments of the abdomen of a fine bright, the anus of a deeper orange; legs testaceous.

Very near *D. flavipes*, but the sculpture of the prothorax, the impressions of the elytra, and the colour of the underside of the abdomen are different. It differs from *D. discolor* in having the prothorax much more thinly punctured, the anterior tubercles, which in that species are near obsolete, more prominent, and the scutellum much smaller.

[Named *D. Kirbyi* by Lacordaire.]

303. DONACIA EMARGINATA *Kirby*.—Length of body 3⅔ lines. Taken with the preceding.

[225.] Body black-blue, clothed underneath with pile, in certain lights, glittering like silver. Antennae black; tubercles of the prothorax prominent; elytra with an impression near the suture; last dorsal segment of the abdomen emarginate; thighs very thick, bronzed, posterior one with a stout tooth.

This species comes very near *D. sericea*, but it is sufficiently distinguished by its deeply notched podex, and the silver pile that clothes its body underneath, which in that species has a golden lustre.

[Taken in Canada and at Lake Superior.]

304. DONACIA PROXIMA *Kirby*.—Length of body 5 lines. Taken in Canada by Dr. Bigsby.

Body a little flattened, covered underneath with a dense coat of glittering silver pile resembling satin. Head a little bronzed, channelled between the eyes, minutely punctured; palpi testaceous; antennae entirely black; prothorax in the disk dark violet and channelled, sides bronzed

and impressed; anterior tubercles not prominent; scutellum bronzed; elytra nearly black with a slight tint of violet, punctures green-gilt, interstices of the rows not wrinkled; an anterior impression near the suture; rounded at the apex; posterior legs long, with thighs somewhat curved, attenuated at the base, armed at the apex with two teeth placed consecutively, the first long, slender, and acute; the last wide, short, and denticulated posteriorly.

This species is nearly related to *D. crassipes* Fab., but the antennae and the legs are entirely black, the teeth on the posterior thighs are not equal.

[Probably synonymous with *D. episcopalis* Lac. Taken on shore of Lake Superior.]

MISCELLANEOUS.

PERSONAL.— In part No. 2, "Lepidoptera, Rhopaloceres and Heterocceres," the author, Mr. Herman Strecker, makes a most uncalled for and ungentlemanly attack on me, which in justice to myself, much as I dislike introducing matters of this sort into a scientific periodical, I can scarcely allow to pass unnoticed.

It appears that Mr. Strecker received last summer, from Mr. Couper, specimens of a Papilio which he had taken on the Island of Anticosti while on a collecting tour there. At first Mr. S. says he thought it might be my P. brevicauda, described in a foot note in "Packard's Guide," but on comparing the description there given with his specimens, he found them to differ in some important particulars. He then proceeds to say (I copy *verb. at lit.*,) "I now again had the pleasant excitement incidental to endeavoring to study out bare descriptions, unaccompanied by figures, and in my misery I wrote to Mr. Couper, in Montreal, requesting him to try to see the types of Brevicauda, and compare his examples with them, or if that was impossible, to write to Mr. Saunders, of Ontario, Canada, who described it and with whom he was acquainted, concerning the species; after some time Mr. Couper wrote 'I communicated with the Rev. Canon Innes (in whose collection are specimens of Brevicauda) and Mr. W. Saunders, asking for information regarding P. Brevicauda; up to this instant no answer from either;' this certainly was not very satisfactory, but as I was not particularly anxious to make a fool of myself by re-christening old species, I importuned Mr. Couper to try the gentleman

with another epistolary shot; in due time, under date March 17, 1873, came another letter from Couper thus: 'I have purposely delayed a reply to your favor of 2nd, because since its receipt I wrote again to Mr. W. Saunders for the desired information, and my letter was written in terms which could not deter him from answering; however, no answer has been received.' After receiving this letter, I, of course, concluded that Mr. Saunders' time was of too much value to be encroached upon, and requested Mr. Couper to by no means trouble him again, as his dignified silence at last brought me to a proper sense of my true position, and was a merited punishment to both Couper and myself for our temerity."

I did receive the two letters referred to from Mr. Couper. In the first, dated Jan. 21, Mr. C. asks me where I obtained the Papilio described as *brevicauda*, and whether I would loan him a specimen, as he wished to compare it with some Anticosti Papilio's which had been named for him by his U. S. correspondents as *P. polyxenes*. There were other matters referred to in the letter which I wished to attend to before replying to Mr. Couper, and as I was then extremely busy, and was obliged to leave home for a while, not knowing either that there was any pressing need of an immediate answer, I deferred writing for a time. In the second letter, dated March 3rd, Mr. C. refers again among other matters to *P. brevicauda*, expresses no disappointment at my not answering his first, does not even now ask for a prompt reply, or hint that any of the information he desires was for anyone but himself. Indeed, after referring to some differences which he thought existed between his Anticosti specimens and my *brevicauda* from Newfoundland, he says: "It is *my intention* to investigate this matter further," and referred to the opportunities he hoped to have on revisiting the Island. To this second letter I replied as promptly as possible, within a few days, and gave Mr. C. all the information in my power in reference to *brevicauda*, as well as satisfactory reasons why I had not written sooner.

It was scarcely kind of Mr. Couper to give me no hint of the terrible state of excitement under which his friend, poor Mr. Strecker, was at that time laboring, boiling over, as he evidently was, with indignation towards one who was perfectly innocent of all knowledge of his wants. Had I known the state of his mind my sympathies would at once have been aroused and I should have written promptly, when I suppose this formidable bull of his would never have been fulminated against me, and I should have been spared from being impaled on the sharp end of Mr.

Strecker's irony, where, like a beetle on a pin, I am now supposed to be wriggling and writhing in great discomfort.

I do not know Mr. Strecker and have never had any correspondence with him, but I do feel sorry for him, that he should in his anger have allowed himself to use language so discorteous in reference to one who was a perfect stranger to him, without taking pains to enquire whether it was deserved or not. I can scarcely designate such a proceeding under such circumstances, as anything less than contemptible, and quite unworthy of a naturalist or a gentleman.

Mr. Strecker further remarks in the paragraph following that last quoted: "However, I believe this is distinct from Brevicauda, and if it be not, *it is an absurdity to retain that name;* the probability after all is that Brevicauda and Anticostiensis (if they be not the same) are both varieties of Asterius." Why Mr. Strecker considers it *absurd* to call a species *brevicauda* he does not deign to inform us; can it be that he has a conscientious objection to any further references to the tails of insects under any circumstances, or is it the *evident superiority* in length and grandiloquence of sound which *Anticostiensis* has over *brevicauda* which makes the use of the latter to his mind so absurd? It does seem strange that with all Mr. Strecker's anxiety to avoid "re-christening old species," he should astonish the Entomological world with such a name as *Anticostiensis* nov. sp., when at the same time he states his belief in the probability of its being but a variety of *asterias*. Such a proceeding seems at least contradictory, and, it will appear to some, as if he had thus placed himself, in his anxiety to have his name attached to a species, in the very position he professes a wish to avoid, and which he has designated in such choice! language.—W. SAUNDERS, London, Ontario.

TO COLLECTORS.–I am very anxious to obtain the eggs, larvæ in different stages, and chrysalis of *Grapta faunus*, and I will offer as a reward to any one who will obtain them for me, Vol. I of the "Butterflies of North America," or Vol. II, as it shall appear. Where this species is common, that is, in the highlands of New York and New England, or British America, it would not be difficult to obtain eggs at the proper season, and from these all the rest would follow. In the Catskill Mountains, the fresh specimens of *Faunus* appear about the 1st of August, and by the 15th are plenty. Allowing eleven days for chrysalis, the mature larvæ would be found between the 20th of July and the 5th of August. From egg to chrysalis

will be about fifteen days, and allowing four days for duration of the egg, we may conclude that this is deposited from 1st to 15th of July. Therefore, an effort should be made to take the females the last of June or first of July; and when taken, they should be enclosed in a gauze bag, on a stem of Hop, or on Nettle, Elm, and perhaps Currant or Wild Gooseberry; or enclosed in a keg, if convenient (nail or powder keg), from which the heads have been removed, and the upper end covered with a cloth, held down by one of the hoops. Care should be taken to stop up all holes next the ground by which the insect would escape. In this way eggs will infallibly be had, if the insect is confined with the food plant of the larvæ. In the present case, as that is not certainly known, if after 24 hours no eggs are found to be deposited, I should try one of the other plants named. If eggs are obtained, two or three should be placed in a small vial of water, to which has been added a few drops of carbolic acid solution, which preserves them effectually, and should be sent by mail to Miss Mary Peart, Pauling, Chester Co., Pennsylvania, for drawings for me. In the same way, the larvæ at different stages may be sent, in tin or wooden (not paper) boxes, by mail, with a supply of the food plant, advising by letter of such sending. The chrysalis may be sent in the same way as soon as formed. It is desirable that as full notes as possible should be taken of the changes of the larvæ. These I will publish, as well as the drawings, in Vol. II of But. N. A., with credit to the discoverer and observer.

In the same way, it is desirable that the larva of *G. gracilis* should be found, and I will give a similar reward for the discovery of the preparatory stages of this species, if attention is given to my directions in forwarding the eggs, larvæ and chrysalids for drawings.—Wm. H. Edwards, Coalburgh, West Va., May 24th, 1873.

ADVERTISEMENTS.

Exchange.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. Wasserman, Beverly Terrace, Cullercoats, North Shields, England.

Coleoptera for Sale.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by John Akhurst, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

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OBSERVATIONS ON CERTAIN PLANT LICE OF THE GENUS APHIS.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

That the Aphides in the spring time are wingless, virgin females, is an opinion that has been carefully entertained by some of the most distinguished naturalists and physiologists in the world. Bonnet, Reaumur, Owen, Huxley, &c., have especially studied this interesting class of insects, and have given expression to the above opinion in their writings. But this, there are strong reasons for asserting, must be taken in a restricted sense, so far, at any rate, as our own Aphidæ are concerned.

Whilst engaged recently in an examination of a species which was observed feeding upon the leaves and tender shoots of *Rumex crispus*, with the view of testing its manner and rate of reproduction, several clusters of the insect were met with, each of which, contrary to expectation, contained one or two winged specimens. These, in addition to the possession of wings, differed still further from the apterous ones in the superior length of the antennæ, and in the remarkable fulness of the thorax above; this fulness being undoubtedly necessary for the attachment of the wings and the muscles by which they are controlled. In color the wingless specimens were entirely jet black, which, however, in those endowed with the power of flight, was somewhat relieved by the presence of a light fulvous annulus upon each antenna and tibia.

The presence of wings in some of the specimens at this season of the year, in view of the assertions of naturalists to the contrary, would seem to imply the existence of males. This impression does seem to be further heightened and strengthened by comparison with drawings of the male rose Aphis in "Duncan's Transformation of Insects." To be assured

upon this point, a solitary winged specimen was secured and confined in a box in which a sprig of the insect's natural food had been previously placed to satisfy its wants ; due examination having been made to the intent that nothing in the shape of food or animal life should stand in the way of a fair and impartial test. After the lapse of twenty-four hours, the inside of the box and its contents were examined with a glass of moderate diameter, and a single, newly-born Aphis was discovered fastened to a leaf stalk, in the act of imbibing its juice.

A further continuance of the feeding process for several days longer was productive of the same positive results. The rate of increase in this species, as shown by these experiments, unlke its European congeners, was proved to be but one a day; so it is to be seen that the insect does not propagate as rapidly in this case at any rate, as naturalists have asserted. European species, we read, produce at the rate of three, four, and seven a day, according to eminent authorities. As our native American species differ in many points from European, in a structural as well as a functional sense, this difference in the rate of propagation may not be wondered at. From the above facts it does seem that nature has decreed that there shall be both winged and wingless specimens in the spring time, for it seems just to conclude that both varieties are virgin females. But other observations which were subsequently made, seem to foreshadow the existence of males also ; but the evidence upon this point is not of the most positive character, and requires further facts to settle it beyond the shadow of a doubt.

Having secured similar winged specimens a few days later, they were submitted to a like test, when both positive and negative results were reached. Here was a rather curious and interesting problem for solution. Why some should prove fertile, and others, which in no single particular differed therefrom, so far as could be determined, should manifest a contrary state of affairs was more than could be divined, and this too after frequent experiments had been made. If the latter are males, as their sterility would seem to indicate, the solution is self-evident ; but if of the opposite sex, there can be no adequate key to unlock the problem, unless the principle of excessive nutrition, which seems to account for so many strange things in the vegetable creation, should prove to be it. But even here a doubt arises, as observation has shown me that a succulent shoot produces almost invariably wingless specimens, while a less tender one the opposite variety. As the very existence of the two forms depends upon

the quantity of sap which each obtains, said quantity being measured by the nature of the shoot, whether succulent or otherwise, the only rational conclusion that can be drawn is to consider the sterile form as male. The correct course to have adopted would have been a dissection of the animal, and a comparison of the organs of reproduction, but in this I was debarred by the want of suitable instruments for the purpose.

From what has been written upon European species, combined with the facts developed in this paper, it seems safe to conclude that the Aphidæ reproduce both in a sexual and asexual manner. If not sexually, then there is no getting rid of the conclusion that in the spring of the year three forms of females are produced, wingless virgin, winged virgin, and winged sterile females. As a further confirmation of the above facts, let me add that similar experiments were performed upon a small drab-colored species, which was found feeding upon the leaves and succulent shoots of *Spiraea corymbosa*, with similar results.

NOTES ON RHYNCOPHORUS ZIMMERMANII, Sch.

BY S. V. SUMMERS, NEW ORLEANS, LA.

Larvæ, long, 1.07 to 1.40 inch. Head rather large, smooth, vertical; occiput dark chestnut brown; medial line abbreviated, but well defined; lateral lines complete; vertex piceous, sculptured; front rufo-piceous; mandibles obtuse, opaque, with three large deep impressed punctures; labium 3-dentate; mentum sinuated, sub-flavous. Body sub-cylindrical, not curved, sub-flavous, middle segments largest, humeral and anal segments corneous, brownish; legs replaced by six tubercles.

Described from seven living matured larvæ.

Pupæ, long, 1.10 to 1.24 inch. Quite characteristic of imago, tawny yellow; prothorax and metasternum piceous; rostrum bent close on prosternum, and reaching anterior margin of metasternum; elytra enclosing posterior legs. Three specimens.

R. Zimmermanii. Long (exclusive of rostrum), 0.66 to 1.20 inch. Black, shining, rostrum shorter than thorax; ♂ nearly arcuate before antennæ, smooth, with rather large punctures; ♀ not arcuate, tuberculate; antennæ with outer half of first joint rufous; eyes large, finely

granulate; prothorax longer than broad, smooth, finely and sparsely punctured; angles rounded; basal margin closely embracing elytra; scutellum prolonged, polished; elytra with six distinctly punctured striæ which do not quite reach the apex; intervals broadly rounded.

Inhabits Southern and Gulf States; abundant. Our largest curculio, of which numerous varieties occur while immature, the most common variety has the elytra and thorax reddish-brown, with three black spots on elytra and one or more on thorax.

The larvæ bore in the roots and stocks of the Palmetto, in the latter part of June and July. When about to pupate, they construct an oblong cocoon, which consists of layers of fibres and excrement loosely woven together. These are invariably formed at the thickened basal part of leaves' stems, from which the imago issues in September and October. They do not seem to be attracted by the lamp, but on several occasions during the month of February, in the vicinity of New Orleans, I have observed large numbers flying among the Palmetto's, when they would produce a buzzing noise similar to *Copris carolina*. They seem most partial to the older and more injured plants, particularly those having been burnt. As many as sixty specimens have occurred in a single tree.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 115

CYLLENE, *gen. nov.*

Anterior and posterior wings linear lanceolate, and apparently destitute of nervures. (In a single specimen of the hind wing, mounted as a microscopic specimen in Canada balsam, a short costal nervure, a subcostal and an independent nervure close along the posterior margin, but not beginning at the base, are visible, but ordinarily I can find no trace of any nervure except *perhaps* the costal is visible; to all ordinary observation the wings are without nervures.) The posterior are excised from the basal fourth of the costal margin to the apex. Size minute. The other generic characters are those of *Clymene (supra)*, and it is characterized like it by the erect or reversed hair-like scales. But it lacks the pale spots in the integuments of the wings, which characterize *Clymene*.

C. minutisimella. N. sp.

Vertex, palpi and abdomen silvery; face rather sordid white: antennæ dark griseous or fuscous, tipped with whitish; anterior wings brown mixed towards the base confusedly with silvery, with a distinct silvery spot on the costal margin, two others on the dorsal margin, one of which is just behind the middle and the other farther back: one at the apex and one on the costal margin opposite the space between the two dorsal ones. In some lights these spots are not distinct. Ciliæ and hind wings dark griseous.

Alar ex. scarcely exceeding 1/8 inch. It is therefore probably the smallest Lepidopteron known. Mr. Stainton, *Nat. Hist. Tin., v. 1*, says that *Nepticula microtheriella*, measuring 1 3/4 lines in *alar ex.*, was then the smallest. It is a shaggy and rather "uncanny" looking little moth. The larva is unknown. I have taken the imago abundantly in May and July at the lamp. But I find that I have but a single specimen left, for, as it is too small to pin successfully, I placed it in a tin "cell" on a microscope slide, covered by thin glass, held down by a rubber band, into which crept villainous little *Atropes* and ate all my little *Cyllene* save one.

NEPTICULA.

Nepticula miners of leaves of the Sycamore *(Platanus occidentalis.)*

Three species of *Nepticula* mine these leaves. Dr. Clemens describes these mines fully *(Proc. Ent. Soc. Phila., March, 1862)*. One of the mines is at first a slender track *filled with frass.* Afterwards the mine is expanded into a round blotch, almost obliterating the previous linear mine. This is the mine of

N. platanella Clem., *Proc. Ent. Soc. Phila, Jan'y, 1862.*

It may be distinguished from the two other species by having the wings shining dark brown, *with a silvery costal streak about the middle, and an opposite spot of the same hue on the dorsal margin.* For other particulars see Clemens' description. *Al. ex.* 1/8 inch. Kentucky.

The mine described by Dr. Clemens as No. 2 is linear, slightly enlarged towards its extremity, with the terminal portion enlarged into a small blotch just before the larva leaves it. *It has a central line of frass.* Dr. Clemens was not acquainted with the imago which I call

N. Clemensella. N. sp.

Palpi and face stramineous, tinged with rufous between the antennæ and eyes; eye-caps yellowish silvery. Antennæ pale fuscous. Primaries

bluish black, *with a minute ochreous spot on the extreme dorsal margin about the middle.* Viewed from the direction of the head there is a faint silvery streak visible opposite the ochreous spot, but it is not visible with the light in any other direction usually, although in one specimen it is visible *on one wing* in any light, but is not on the other. Ciliæ pale yellow, with a dark brown hinder marginal line near the base. *Al. ex.* $\frac{1}{3}$ inch. Kentucky; Pennsylvania.

The mine of the third species is at first crooked, with a *central line of frass.* It is afterwards enlarged, forming an irregular blotch, which covers all or nearly all of the original mine. It then resembles the mine of *N. platanella*, but is less rounded and the outline is more irregular. I have not succeeded in breeding this species, but have no doubt that the species described below as *N. maximella* is the maker of the mine.

N. maximella. N. sp.

Head and eye-caps yellowish white; palpi a little paler; antennæ dark fuscous above, whitish beneath; thorax and anterior wings bluish black, with a silvery white fascia about the middle, concave towards the base, and sometimes faintly interrupted in the middle. Apical ciliæ whitish, with a dark brown hinder marginal line near the base. *Al. ex.* $\frac{1}{4}$ inch. Kentucky.

Taken in large numbers resting on the trunk and leaves of Sycamore trees *(P. occidentalis)*, seldom elsewhere, and I believe it to be the miner No. 3.

N. serotinæella. N. sp.

Tuft rufous; face reddish yellow; palpi silvery gray; eye-caps and hinder portion of the vertex very pale or whitish golden; thorax and primaries blackish, with purple and bronzy reflections, the primaries crossed by two silver fasciæ, both of which are straight, the first being rather the widest, placed just before the middle, the second just before the beginning of the ciliae; cliae of the general hue, but in some lights silvery gray, the dorsal ciliae rather pale. *Al. ex.* $\frac{1}{3}$ inch. Kentucky.

The larva makes a very pretty mine on the leaves of the Wild Cherry *(Prunus serotina)*. The mine is narrow, linear, very much convoluted at first, filled with frass, which afterwards becomes a central line only in the mine, which is gradually a little widened; the mine is whitish and the frass black, but to the naked eye the mine appears brownish red, and

the leaf around it also becomes stained of that hue. The larva is bright green. Possibly this may be the *N. bifasciella* Clem., but I can discern no trace of green in the wings. Dr. Clemens gives no measurements and was not acquainted with the mine of *bifasciella*. He mentions, *Proc. Ent. Soc. Phila., Nov., 1861*, an empty mine in the leaves of the Wild Cherry as doubtfully that of a *Nepticula*, and possibly dipterous, and calls it *N.? prunifoliella*. As, however, he says that that mine begins in a blotch, and as he was not acquainted with the insect in any of its stages, and it often happens that two or three species mine leaves of the same plant, I have not deemed it expedient to adopt his name. The practice of naming species from an empty mine or even a larva, is a bad one, I think.

N. apici-albella. N. sp.

Palpi and eye-caps white; face reddish orange; antennae silvery, suffused with fuscous; thorax and primaries dark brown, slightly iridescent, suffused with purplish or golden, according to the light; just behind the middle of the wing is an oblique white fascia, which is nearest to the apex on the dorsal margin; ciliae of the general hue, except at the extreme apex, which is white. *Al. ex.* $\frac{5}{12}$ inch. Kentucky. Larva unknown. Imago in June.

N. minimella. N. sp.

Palpi white; face ochreous; eye-caps white; antennae light fuscous; primaries fuscous to the fascia, which is just immediately behind the middle, and *is convex both anteriorly and posteriorly;* purplish fuscous behind the fascia; apex whitish. *Al. ex.* less than two lines. Kentucky. At light in August.

N. thoracc-albella. N. sp.

Palpi and eye-caps white; face reddish ochreous; antennae pale fuscous; thorax white, with a few scattered dark brown scales; primaries dark brown, with a curved white fascia about the middle, concave towards the base, and rather indistinct upon the costa. A white spot at the beginning of the costal ciliae, and an opposite dorsal one; ciliae of the general hue, except at the apex, where they are white. *Al. ex.* $\frac{1}{4}$ inch. Captured in June in Kentucky.

N. querci-castanella. N. sp.

Head, eye caps and palpi white, except a dark brown spot between the antennae on the head; antennae dark brown above, whitish beneath;

thorax and primaries yellowish ochreous, well dusted with dark brown; ciliae pale ochreous. *Al. ex.* $\frac{5}{32}$ inch. Kentucky.

The larva makes a somewhat crooked linear yellowish-white mine, with a central line of frass, in the leaves of the Chestnut Oak (*Quercus castanea*), in the latter part of July.

N. fusco-capitella. N. sp.

Head dark fuscous; palpi, eye-caps and antennae yellowish white, the antennae somewhat stained with fuscous above; primaries and thorax white, faintly tinged with yellowish, and the apical half of the primaries dusted with fuscous scales arranged mainly in small spots; body and legs creamy white. *Al. ex.* almost $\frac{1}{4}$ inch. Captured in Kentucky in June.

N. ochre-fasciella. N. sp.

Head and eye-caps pale reddish-ochreous; palpi a little paler; antennæ pale fuscous, with a silvery lustre; thorax and primaries blackish-brown, with a nearly straight yellowish-ochreous fascia just before the middle; apical ciliae yellowish-ochreous, basal half of the primaries yellowish-ochreous on the under surface. *Al. ex.* scarcely $\frac{1}{4}$ inch. Kentucky. Taken in June.

N. ciliæ-fuscella. N. sp.

Palpi silvery; head reddish-yellow; eye-caps silvery; thorax and fore-wings dark brown, a little bronzed, and cilliae of the same hue. A white fascia just behind the middle of the wing, nearly straight, a little widest on the dorsal margin, and *perhaps* a little nearer to the base on the costal margin; under surface and legs yellowish white; posterior tibiae fuscous. *Al. ex.* $\frac{6}{32}$ of an inch. Taken at lamp, Aug. 23rd.

I cannot see wherein this species differs from *fusco-tibiella* Clem., except that Clemens says "Ciliae pale grayish," whereas the ciliae in this species have the bronzy dark brown hue of the wings. Dr. Clemens gives no measurements.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 117.)

305. DONACIA CUPRÆA *Kirby*.—Length of body 4½ lines. Taken in Canada by Dr. Bigsby [also on Lake Superior.]

[226.] Body above copper-coloured, glossy; underneath covered with a thick coat of decumbent pile of a cinereous colour, glittering in certain lights. Head downy, channelled; mouth and palpi rufous; mandibles and antennae black; prothorax rather wider than long, very minutely, thickly and confluently punctured and wrinkled; channelled, with a pair of impressions on each side, anterior tubercles not prominent; scutellum downy; elytra very grossly punctured in rows; a single anterior impression near the suture; truncated at the apex; three intermediate ventral segments of the abdomen have a yellow margin; legs obscurely rufous; thighs bronzed in the middle; posterior thighs with a minute tooth near the apex.

306. DONACIA HIRTICOLLIS *Kirby*.—Length of body 3½ lines. A single specimen taken in Lat. 65°.

Body underneath covered with a thick coat of decumbent pile resembling satin and shining like silver. Head hoary from inconspicuous hairs, most minutely and confluently punctured with a slight interocular channel with an obtuse ridge on each side; antennae with the second and third joints equal in length; labrum glittering with silver pile; prothorax longer than wide, hoary from inconspicuous down, most minutely and confluently punctured, channelled, sides subimpressed, anterior tubercles flat; scutellum large, levigated; elytra black, punctured in rows, whose interstices are wrinkled; posterior thighs with a single short obtusangular tooth.

This pretty species comes near *D. bidens* Oliv., which I always find on *Potamogeton natans*, but it is sufficiently distinguished by its black thorax hoary from down, and legs without any red.

[Synonymous with *D. rudicollis* Lac. Taken on Lake Superior.]

307. DONACIA ÆQUALIS *Say.*—Length of body 4–4½ lines. Many taken in the journey from New York to Cumberland-house [also in Ontario.]

[227.] Body underneath covered with a thick coat of silver pile as in the preceding species. Head bronzed, hoary from cinereous down, minutely and confluently punctured, channelled between the eyes with a longitudinal obtuse ridge on each side the channel; antennae black, bronzed at the base, second and third joints equal in length; mouth piceous; prothorax bronzed and gilded, rather longer than wide, thickly and confluently punctured and wrinkled; channelled; sides longitudinally subimpressed; anterior tubercles obsolete; scutellum hoary from down; elytra bronzed, gilded, punctured in rows except at the apex where the punctures are confluent, two impressions adjoining the suture, and one in the middle of the base; apex truncated; ventral segments of the abdomen, the last excepted, with a bright orange margin; posterior thighs with a stout short tooth.

N. B. In the male the ventral segments are without the orange margin.

VARIETY B. Prothorax bright copper, elytra black-bronzed.

FAMILY HISPIDÆ.

308. HISPA *(Anoplitis)* BICOLOR *Oliv.*—Length of body 3¾ lines. Taken in Canada by Dr. Bigsby. Mr. Francillon had specimens from Georgia. Oliv.

[228.] Body linear, naked. Head black, smooth, channelled between the eyes; antennae robust, scarcely longer than the prothorax, black; eyes large, dark-brown; prothorax transverse, narrowest anteriorly, red, with four dusky spots placed transversely, grossly punctured, posterior angles producted, behind with a slight sinus on each side; space above the scutellum truncate; scutellum dull-red; elytra linear, black, three-ridged, with an abbreviated ridge towards the apex between the second and third; ridges elevated; interstices with a double series of large and very close punctures; between the second and third at the base and apex the series is quadruple, in the middle triple; lateral margin and apex serrulate; underside of the body blood-red; legs black, base of the thighs red.

FAMILY COCCINELLIDÆ.

309. COCCINELLA EPISCOPALIS *Kirby*.—Plate v, fig. 4. Length of body 2 lines. Taken in the journey from New York to Cumberland-house.

[229.] Body narrow, nearly linear, having at first sight the aspect of a *Haltica*, underneath black. Head black with three oblong pale yellow spots, two adjoining the eyes on their inner side, and one placed backwards in the vertex; mouth, antennae, and palpi rufous; prothorax and both elytra taken together, pale yellow with two black stripes, common to both, resembling a bishop's crosier, the crook being on the thorax and the stalk on the elytra; suture of the latter black except at the tip; legs pale testaceous; anus, sides of the abdomen, and tips of the ventral segment, except the basal one, pale.

[Belongs to *Nœmia* Muls.]

310. COCCINELLA TREDECIM-PUNCTATA *Linn.*—Length of body 3 lines. Several specimens taken in Lat. 54°.

Body oblong, black, lightly and minutely punctured; underneath slightly downy. Mouth and its organs pale rufous; nose white, whiteness with a posterior central lobe; antennae rufous; prothorax white with a large discoidal spot falling short of the anterior margin, where it is truncated; sides lobed, besides which there is a black dot on each side connected with the above spot; elytra reddish-yellow with six largish black dots, namely 1, 2, 2, 1, and one at the scutellum common to both elytra; the first marginal dot is ovate, the rest approaching to round; the tibiae and tarsi are testaceous; there are two transverse white spots on each side the breast, between the four posterior legs; and four triangular pale ones on each side the abdomen.

VARIETY B. Nose rufous, with a parallegramniscal white spot between the antennae.

[Belongs to *Hippodamia* Muls.; very common in Canada.]

311. COCCINELLA TRIDENS *Kirby*.—Length of body 2¼ lines. Two specimens taken in the Expedition.

[230.] Body rather oblong, very minutely punctured; black underneath, with two distant white spots on the breast, and three contiguous ones on each side of the abdomen. Head black with a transverse white band or trident between the eyes, tricuspidate both anteriorly and

posteriorly; the intermediate posterior lobe the longest; prothorax white with a large bipartite black spot, each lobe being trilobed with rounded lobes resembling a trefoil leaf and connected with the other by a transverse band; elytra pale reddish-yellow; with three black spots and one at the scutellum common to both elytra, placed 2, 1, 1; the scutellar spot somewhat bell-shaped, the humeral one roundish, the intermediate one nearly kidney-shaped, and that nearest the apex rather crescent-shaped.

VARIETY B. Frontal band replaced by three white spots, the intermediate the longest and linear.

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

The following list has been prepared to enumerate all the known Coleoptera—not new—found in Southern Missouri, collected on a line between St. Louis and Sedalia during the summers of 1869, '70, '71, and '72. The families Curculionidæ and Cerambycidæ are omitted in this list.

CICINDELIDÆ.

TETRACHA, *Westw.*
- carolina, *Linn.*
- virginica, *Linn.*

CICINDELA, *Linn.*
- sexguttata, *Fab.*
- purpurea, *Oliv.*
- splendida, *Hentz.*
- var. audubonii, *Lec.*
- generosa, *Dej.*

CICINDELA, *Linn. (continued.)*
- vulgaris, *Say.*
- repanda, *Dej.*
- var. 12-guttata, *Chaud.*
- hirticollis, *Say.*
- cuprascens, *Lec.*
- macra, *Lec.*
- lepida, *Dej.*
- punctulata, *Fab.*

CARABIDÆ.

OMOPHRON, *Latr.*
- tesselatum, *Say.*
- americanum, *Dej.*
- nitidulum, *Lec.*

ELAPHRUS, *Fab.*
- clairvillei, *Kirby.*
- ruscarius, *Say.*

NOTIOPHILUS, *Dum.*
sibiricus, *Motsch.*
NEBRIA, *Latr.*
pallipes, *Say.*
CALOSOMA, *Fab.*
externum, *Say.*
scrutator, *Fab.*
Wilcoxi, *Lec.*
frigidum, *Lec.*
Sayi, *Dej.*
calidum, *Fab.*
CYCHRUS, *Fab.*
lecontei, *Dej.*
elevatus, *Fab.*
PASIMACHUS, *Bon.*
elongatus, *Lec.*
punctulatus, *Fab.*
SCARITES, *Fab.*
substriatus, *Hald.*
subterraneus, *Fab.*
DYSCHIRIUS, *Bon.*
globulosus, *Say.*
sphæricollis, *Say.*
truncatus, *Lec.*
sellatus, *Lec.*
ARDISTOMIS, *Putz.*
viridis, *Say.*
ASPIDOGLOSSA, *Putz.*
subangulata, *Lec.*
CLIVINA, *Latr.*
corvina, *Putz.*
cordata, *Putz.*
ferrea, *Lec.*
bipustulata, *Fab.*
SCHIZOGENIUS, *Putz.*
ferruginea, *Putz.*
amphibius, *Hald.*
BRACHINUS, *Weber.*
tomentarius, *Lec.*
alternans, *Dej.*
strenuus, *Lec.*
perplexus, *Dej.*
americanus, *Lec.*
ballistarius, *Lec.*
fumans, *Fab.*
cordicollis, *Dej.*
medius, *Lec.*
lateralis, *Dej.*
distinguendus, *Chaud.*
patruelis, *Lec.*
rejectus, *Lec.*
pumilo, *Lec.*
PANAGAEUS, *Latr.*
fasciatus, *Say.*
MORIO, *Latr.*
georgiae, *Beaur.*
HELLUOMORPHA, *Lap.*
laticornis, *Dej.*
GALERITA, *Fab.*
atripes, *Lec.*
janus, *Fab.*
lecontei, *Dej.*
bicolor, *Drury.*
ZUPHIUM, *Latr.*
americanum, *Dej.*
CASNONIA, *Latr.*
pennsylvanica, *Linn.*
LEPTOTRACHELUS, *Latr.*
dorsalis, *Fabr.*
PLOCHIONUS, *Dej.*
bonfilsii, *Dej.*
LEBIA, *Latr.*
grandis, *Hentz.*
atriventris, *Say.*

LEBIA, *Latyr. (continued.)*
pumila, *Dej.*
furcata, *Lec.*
scapularis, *Dej.*
vittata, *Fab.*
lobulata, *Lec.*
pulchella, *Dej.*
bivittata, *Fab.*
viridipennis, *Dej.*
marginicollis, *Dej.*
var. affinis, *Dej.*
viridis, *Say.*
var. moesta, *Lec.*
ornata, *Say.*
TETRAGONODERUS.
fasciatus, *Hald.*
BLECHRUS, *Motsch.*
linearis, *Sch.*
AXINOPALPUS, *Lec.*
biplagiatus, *Dej.*
GLYCIA, *Chaud.*
purpurea, *Say.*
CYMINDIS, *Latr.*
americana, *Dej.*
pilosa, *Say.*
CALLIDA, *Dej.*
punctata, *Lec.*
CALATHUS, *Bon.*
gregarius, *Say.*
opaculus, *Lec.*
impunctata, *Say.*
PLATYNUS, *Bon.*
marginatus, *Chaud.*
pusillus, *Lec.*
sinuatus, *Dej.*
extensicollis, *Say.*
decorus, *Say.*
cupripennis, *Say.*

PLATYNUS, *Bon. (continued.)*
punctiformis, *Say.*
limbatus, *Say.*
crenistriatus, *Lec.*
pectinicornis, *Newm.*
crenulatus, *Lec.*
lutulentus, *Lec.*
octopunctatus, *Fab.*
OLISTHOPUS, *Dej.*
parmatus, *Say.*
micans, *Lec.*
LOXANDRUS, *Lec.*
erraticus, *Dej.*
minor, *Chaud.*
taeniatus, *Lec.*
EVARTHRUS, *Lec.*
sexim pressus, *Lec.*
obsoletus, *Say.*
incisus, *Lec.*
substriatus, *Lec.*
colossus, *Lec.*
orbatus, *Newm.*
var. sodalis, *Lec.*
PTEROSTICHUS, *Bon.*
chalcites, *Say.*
lucublandus, *Say.*
var. fraternus, *Say.*
var. castanipes, *Kirby.*
var. dilatatus, *Lec.*
coracinus, *Newm.*
erythropus, *Dej.*
caudicalis, *Say.*
disidiosus, *Lec.*
femoralis, *Kirby.*
stygicus, *Say.*
permundus, *Say.*
LOPHOGLOSSUS, *Lec.*
haldemani, *Lec.*

(To be Continued.)

CORRESPONDENCE.

To the Editor:

SIR,—Your notice of "The Bulletin of the Buffalo Society of Natural Sciences," edited, I believe, by Mr. Grote, reminds me that I have a duty to perform.

Mr. Grote has, I am told, named and described a new *Sesia* in the Bulletin (*Sesia marginalis* I think is the name.) To this insect Mr. Grote has no sort of right of any kind, nor had he any right to name or describe it.

It was, as I am informed, simply sent to him by my friend, Mr. Strecker, for the purpose of obtaining his opinion as to whether it was a new species or not, and as it was consigned to Mr. Strecker by me for the express purpose of having it described and figured in his new work now being issued, I must protest against Mr. Grote's action in this matter, and trust that Entomologists generally will mark their disapprobation of this grab game by ignoring altogether Mr. Grote's very unbecoming action in the premises.

W. V. ANDREWS.

P. S.—I shall send the insect to Europe for description, &c., with an explanation of the circumstances.

New York, Aug. 1, 1873.

NOTE BY ED.—We really are unable to sympathize with our correspondent in his grievance. If he has ever done anything in descriptive Entomology he must know what an immense amount of labour is oftentimes involved in the effort to ascertain whether a particular insect has been described before or not. Unless one is thoroughly conversant, by dint of hard study and research, with the group or family to which an insect belongs, one must spend hours of work in hunting through, not only the descriptions of American Entomologists, but also the French, German and Latin, as well as English descriptions of European authors. After all this has been done and one arrives at the conclusion that the insect in question is new to science, it does seem a little hard that the labourer should be required to hand over the results to some one else who has not the ability or the industry to perform the work himself, and to allow him to reap all the credit that may be attached to the publication

of a new specific name. Surely Mr. Andrews is expecting Mr. Grote to do a little too much when he allows him to perform all this labour in identifying a particular species of *Sesia*, and then proposes that some one else should publish the results!

After all, however, it seems to us a very great misfortune that so much importance—so much glory, in fact—is supposed to be acquired by a naturalist by the mere giving a new name to an insect, and the appending of his own to it. Were this kind of renown less sought after—were there more generally diffused amongst us a humble desire to benefit science and increase the sum of human knowledge—we should not be oppressed with such a burden of synonyms as Entomology now groans under—infinite labour would be spared to the conscientious student,—dire confusion and distraction would not so often await the efforts of the pains taking observer.

ECONOMICAL ENTOMOLOGY.

BY PROFESSOR BELL, OF BELLEVILLE.

It is distinctly within my knowledge that many persons who are not overburdened with too large a share of worldly wealth, are strongly inclined to make the study of Entomology and the collecting of insect specimens an employment for their leisure hours, were it not for fear of the expense they believe it necessary to incur for cabinet, cork, pins, &c. Now, the cabinet and cork may be dispensed with—in fact, I have neither the one nor the other myself. I keep my collection in boxes, nineteen by twenty-four inches, outside size, of three-fourth inch pine board planed down to about five-eighth inch, by two and a quarter inches deep; the backs are made of clean basswood planed smooth, and half an inch thick, nailed on to the sides. On the upper edge of the two sides and on one end I fix a slip of thin pine, so as to leave eighteen and an eighth inches clear between the edges, and about one eighth for a groove at the bottom. Over each of these I nail firmly a slip of pine a quarter of an inch thick and a little wider than the thickness of the sides, so as to project over the inside slightly. This forms a groove for a light of glass eighteen by twenty-four inches to slide in, and the groove at the bottom receives the lower edge. The top is left open and the upper edge of the

glass projects about a quarter of an inch above the frame, which is convenient for drawing it out by. The inside is then lined out with paper such as newspapers are printed on, a stout picture-ring is screwed into the *side* at the top, and the box hangs like a picture against the wall.

I find that the Basswood, with a little care in putting in the pins, answers as well as cork; but if a softer substance is thought desirable, take a Basswood log and cut it into slices, about three-eighths of an inch thick, *across the grain*, making the boxes a quarter of an inch deeper and lining the backs with this, previously smoothed with a sharp plane. This is an excellent substitute; in fact I prefer it to cork, as it is free from the hard nodules which often have caused me to bend a pin and spoil a valuable specimen, and it never corrodes the wire, which the acid developed in the cork often does.

Some of my younger friends have adopted this plan, and look with pardonable pride on the adornment of their walls by these cases, which they have coloured and varnished, and which they declare are far superior to any pictures they could afford to buy.

MISCELLANEOUS.

PYRRHARCTIA (*Spilosoma*) ISABELLA.—Under this heading, in the April, '73 No. of the CANADIAN ENTOMOLOGIST, we have from the pen of Mr. Wm. Saunders, a brief history of the habits and metamorphoses of this insect. My experience with the larvae of this moth has been that some individuals at least *are* somewhat particular as to their diet, many rejecting clover and preferring the early shoots of June grass, others persistently refusing the latter and greedily devouring the former, others still ignoring both in their anxiety for some possibly more palatable article of food. Omnivorous they certainly are, but sometimes decidedly finical. Mr. S. states that they are "*probably* subject to the attacks of ichneumons." I have this spring bred from cocoons of *Pyrrharctia Isabella* two parasites, which have been kindly identified for me by Prof. Riley as *Ichneumon signatipes*, Cresson; and *Trogus obsidianator*, Brulle.

I may add as a noticeable fact that I have this morning pinned a brood of *Cryptus nuncius*, Say, bred from cocoon of *Platysamia cecropia*, numbering 21 ♂ and 19 ♀, neither sex, in this instance at least, being remarkably predominant.—O. S. WESTCOTT, Chicago, July 12, 1873.

PHYLLOXERA.—A very important paper has been printed by Government, respecting the *Phylloxera vastatrix*, or new Vine Scourge. It commences with a letter from Sir C. Murray, H. M. Ambassador at Lisbon, calling attention to the ravages of the disease; and stating that the Portuguese Government has named a Commission "to examine into the progress of this dangerous evil, and to gather from all quarters, whether scientific or practical *(sic)* suggestions for the best mode of extirpating it." A report follows from Mr. Crawford, H. M. Consul at Oporto, on the scientific aspects of the disease, as well as several others from French authorities, including a very important one addressed to the Minister of Agriculture and Commerce by the Commission instituted for the study of the new disease, M. Dumas, president. The various papers having been referred to Dr. Hooker for him to report upon them, he states that the only really effectual remedy at present discovered, and this can obviously be only very partially applied and not in the best districts, is flooding the vineyards in winter. He adds: "there is reason to believe that on the first symptoms of attack in isolated cases, the prompt destruction of the vine, its burning on the spot, and the subsequent treatment of the soil with some approved insecticide, such as carbolic acid, would be of great importance." Vines of American species appear at present to have enjoyed immunity from its ravages in the Rhone district, but the disease has undoubtedly appeared in this country on vines cultivated under glass.—*Nature.*

EXCHANGES.—As I have occupied myself for some time with Entomology, and have in my collection a good number of duplicates of insects in all the orders, I am ready to make exchanges with any of the correspondents of the CAN. ENT. I am in especial want of Neuroptera. As I spend the summer in the collection of insects, I believe that I am in a position to make numerous exchanges.—F. X. BELANGER, Naturaliste, Universite Laval, Quebec.

EXCHANGES.—I am much in want of a Canadian correspondent in Lepidoptera. I may say that every Canadian insect is a desideratum to me, for I have not a series of good specimens of any species. I have many, of course, but not a complete series, and there is not a butterfly

which I should not be glad of, even to *Pieris oleracea*, *Grapta faunus*, and *Danais chrysippus*. Thus even the commonest species would be very acceptable. My plan is to send a large box from Liverpool once a year, instead of smaller ones, though I occasionally forward lesser ones by post. Address:—DR. JORDAN, 35 Harborne Road, Edgbaston, Birmingham, England. [We take this opportunity of thanking Dr. Jordan for the little box, containing 46 species of beautiful English Lepidoptera, that he so kindly sent us. They came by post, and, thanks to careful packing, arrived in excellent order. As soon as we obtain a little leisure we shall return the box—not empty.—ED. C. E.]

PIERIS RAPÆ.—This destructive pest of the cabbage and allied plants has now come as far west as Port Hope; it is almost as abundant in our garden as the common *Colias philodice*. No doubt it will proceed as far as Toronto before the close of the season. We have not yet perceived any particular depredation from its larvæ in the kitchen garden, but we fear that we shall not long enjoy this immunity.—C. J. S. B.

SEMBLING.—On the 19th of June last a fine female Cecropia Emperor moth issued from its cocoon, which had been cut from an apple tree and kept in my study for some weeks. Being anxious to try the virtues of the process of "sembling," I fastened its wings by an ordinary spring clip and exposed it on my verandah for several nights without success; the evenings were fine and cool. On the 28th, the evening being warm and misty after a shower, the moth was exposed as usual on an empty flower-stand, just outside of an open window; inside the room on a table a lamp was kept burning. About 11 o'clock, p. m., I entered the room and observed nothing but a few ordinary Noctuae flying about; on returning, however, an hour later, I was amazed to find four splendid specimens of the male Cecropia quietly at rest upon the table and lamp; a few moments after a fifth came in and flew wildly about the room, succeeded in a little while by a sixth! They were all in excellent order and evidently fresh from their cocoons. As I had kept the female so long in confinement, I determined not to continue the experiment any longer; I accordingly dispatched five of the males with chloroform, while the sixth was left with the object of his attraction. The result was a large batch of eggs and subsequent larvae. As the female was entirely hidden from view underneath the window, and was not found by the males, who entered the room to the light instead, flying but a short distance over the fair one of whom they were in search, it is evident that they were guided to the

spot by the sense of smell and not by sight. The light in the room could not have been the primary attraction, as it was so obscured by a trellis covered with creepers as to be hidden from view a few yards off.

Not long after I tried the same experiment with a female *Promethea*, but with no success whatever, though the evenings were often favourable. This failure I attributed to the scarcity of its food plants in the immediate neighbourhood (its cocoon was brought from a considerable distance),and the consequent absence of males within reach of the females' attractive powers.—C. J. S. B.

Noxious Insects.—The Hessian-fly *(Cecidomyia destructor)* has made its appearance in the neighbourhood of London, Ont., and has done a great deal of injury to the spring wheat. The Colorado beetle (*Doryphora decem-lineata*) is very abundant throughout Western Ontario, but, we are happy to say, is being well kept down by the intelligent farmers of that district, who wage an exterminating war upon it with Paris Green. In its eastern progress it has nearly traversed the whole Province of Ontario, but not yet in sufficient numbers to occasion much diminution of the potato crop. To the south-east we learn that it has invaded Maryland and Pennsylvania. In the neighbourhood of London and Guelph, Ont., we observe, with great regret, that the Locust trees are being rapidly destroyed by the ravages of the borer (*Arhopalus robiniæ*, Forster). Young Apple and Mountain Ash trees are also suffering grievously from the attacks of the Buprestis borer (*Chrysobothris femorata*, Fabr.) About Port Hope, Ont., this summer, the Forest and American Tent caterpillars (*Clisiocampa sylvatica* and *Americana*) have been more than usually numerous and destructive.—C. J. S. B.

ADVERTISEMENTS.

Exchange.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. Wasserman, Beverly Terrace, Cullercoats, North Shields, England.

Coleoptera for Sale.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by John Akhurst, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

VOL. V. LONDON, ONT., AUGUST, 1873. No.8

ON SOME OF OUR COMMON INSECTS.

7. *THE FALL WEB-WORM—Hyphantria textor*, Harris.

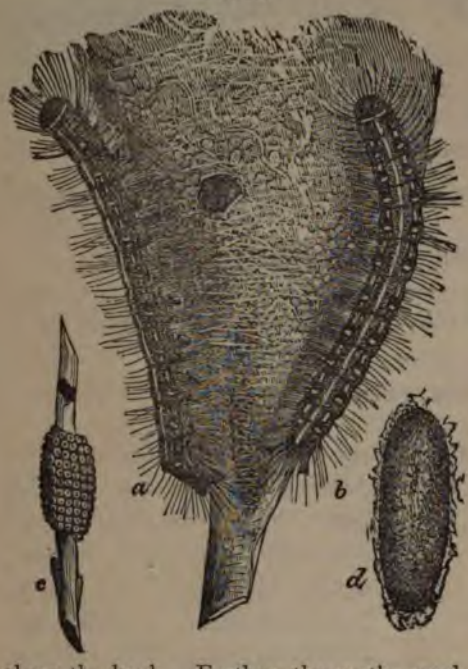
BY THE EDITOR.

Though extremely abundant and very destructive throughout the whole of this Province, and in the neighboring Northern and Middle States, this insect (fig. 16) is very commonly confounded with the equally abundant and noxious Tent Caterpillars (*Clisiocampa Americana* and *Sylvatica*, Harris) see fig. 17. This confusion arises solely from the fact that all three species spin large webs upon the trees they infest, and therefore, without further observation, it is taken for granted that they are one and the same. We feel no surprise at a mistake being made between the two species of Tent Caterpillars, as they closely resemble each other in many respects; but the Fall Web-worm differs from both in almost every particular. For instance, the former are hatched from the egg-bracelets very early in the spring before the apple leaves are fully expanded, and very soon spin in the fork of a limb, or upon the side of the trunk, their thick, silvery white, cobweb-like 'tent;' the latter do not appear till the month of August, when they form a loosely-woven, dirty-coloured web over the end of a bough. Were the web and the 'tent' at once upon the same tree there would be no difficulty in distinguishing between them, but few bear

Fig. 16.

in mind the differences when the one follows the other. Again, the eggs of the Tent Caterpillar are deposited in bracelets of two or three hundred on the twigs of the trees about midsummer, but do not hatch out till the following spring; those of the Web-worm are deposited in little clusters upon the leaves about the middle of June, and hatch out early in August.—The Tent Caterpillars, when fully grown, are over an inch and a half in length, covered with sparse hairs, blackish in colour, ornamented with blue and with either a white stripe or a series of white spots along the back; the Web-worm is much smaller, more hairy, in general colour varying from black to blue and greenish and with a broad blackish stripe along the back. Further, the moths produced from the former belong to the family Bombycidæ, and are of a rusty red or pale brownish colour, with the fore wings crossed in the one species with two pale lines, in the other with two dark ones; the moths of the latter belong to the family Arctiidæ, and are of a pure white colour, free from any markings whatever upon the wings. Lastly, the former pass the winter in the egg; the latter in the pupa state.

Fig. 17.



Having now related the principal characteristics that distinguish *H. textor* from our two species of *Clisiocampa*, it is unnecessary to give any further description of the insect, any indefiniteness being done away with, we trust, by the illustrations prefixed to this paper.

The Fall Web-worm feeds upon the leaves of a great many kinds of trees, few indeed—except the evergreens—appearing to come amiss to it. It seems to be especially fond of the Wild Cherry, Hickory, Ash, Elm, Willow, Apple, Oak, Birch and Button-wood.

The best, and indeed the only feasible remedy for the ravages of this insect is to cut off and burn, or carefully tread under foot, the whole portion of a branch that is covered with the web. As the worms feed always beneath their web, and do not wander over the tree like the Tent Caterpillars, this method of dealing with them is a sure one. Where it is unadvisable to cut off the branch, as may sometimes be the case with young or dwarf fruit trees, the insect may be got rid of by simply drawing the infested leaves through the hand and crushing the caterpillars upon them.

ON MR. SCUDDER'S SYSTEMATIC REVISION OF SOME NEW ENGLAND BUTTERFLIES.

[3RD PAPER.]

Continued from Page 63.

BY A. R. GROTE, CURATOR BUFFALO SOCIETY NATURAL SCIENCES.

6. DANAIS, *Latr.*—It is objected that our species is generally known as *archippus*, to the restitution of the name *plexippus*, given by Linn. to our common species. It is much better to alter a label than to perpetuate an error.

7. BASILARCLIA, *Scudd.*—Together with sixty-eight specimens of *arthemis*, Mr. Chas. Linden took six *proserpina* near Buffalo, N. Y. The material before me makes me feel sure that Mr. Scudder is wrong in referring Edwards' species as a synonym of *ursula*. Traces of the white band and the general size make me suggest that we have possibly to do with a race of *arthemis*. But as yet we must catalogue *proserpina* as distinct. We have a reasonable excuse for preferring *ursula* as the trivial name for our common species. To this genus we must refer *L. weidemeyerii*.

8. DOX-OCOPA, *Hubn.*—It is not disputed, or at least should not be, that we have no true *Apatura* known from the Atlantic district.

9. GRAPTA, *Kirby.*—The retention of Kirby's term is defensible on general grounds.

10. NYMPHALIS, *Latr.* 11. PAPILIO, *Linn.*, restr. *Scudd.*—Schrank's limitation of the term originally used for all the butterflies by Linn. is referred to by Latreille, Insecta Pterodicera, p. 198, where *vanessa* is

considered as the equivalent. I believe that Fabricius' use of the term *Papilio* will not allow us to follow Mr. Scudder's. I remain of the opinion that the older writers before Schrank sufficiently expressed their ideas as to the typical section of the genus, and that the term should be used for a genus of which the European *P. machaon* is the type. As we cannot use *Eugonia*, Hubn., of which *angelica*, Cramer, is the type, I propose the term *Scudderia* for the *Pap. antiopa* of Linnæus.

12. AGLAIS *Dalm.*—This I think we may adopt without hesitation and be thankful for the pretty name.

13. VANESSA, *Fabr.* 14. JUNONIA, *Hubn.* 15. EUPTOIETA, *Doubl.*—The values of these terms have not been altered. The seven genera among which our frittillaries are divided, I think we must agree are tenable. To *Euphydryas* I refer *Melitæa chalcedon*, Boisd., from California.

23. LIBYTHEA, *Fabr.*—We are unfeignedly glad Kirtland's term is retained and that we are not to be vexed by another of Boisduval and Leconte's unfulfilled intentions.

24. CALEPHELIS, *G. & R.*—Mr. Scudder uses erroneously *Polystichtis.* In the *Verzeichniss*, Hubner identifies with an exclamation mark *Papilio fatima*, Cram., 271, A. B., and regards this as the type of *Polystichtis.* It is from Surinam. Our two species from the Atlantic District are generically distinct from the S. American forms. Hubner considers that "*Pap. cereus*" of Linn. is this species of Cramer's, and prefers that name, but this identification may not be correct. Retain *Polystichtis* for the S. American forms, but there is no excuse for stating that "*Papilio cœnius*" is the "type" of *Polystichtis.* We were familiar with Hubner some time ago. We doubt that Linnæus intended our *N. pumila* under his "*cereus*," "*cerea*," or "*cœnius.*" We propose to designate our two species as *Cal. pumila* and *C. borealis.*

So far as we have proceeded some few generic changes seem impossible to be avoided. Many of Hubner's genera are excellently well limited (e. g. Nisoniades), even according to our present views. Perhaps it is not hazarding too much to say that his genera are not in the present state of science, more incongruous than those of any one author of or before his time. It is difficult to say on what plea we shall ignore him. The prejudice has been strong that has hitherto neglected him.

As we must adopt *Oeneis*, Hubner, we propose the term *Callœneis* as

a substitute for Mulsant's synchronic term. *C. pusilla* is from Nebraska.

Hubner's subsequent use of the term *Eugonia* in the Phalaenidæ cannot be defended. I propose the term *Eriplatymetra* for our *E. coloradaria* and the European *E. angularia.*

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

(Continued from Page 134.)

CARABIDÆ.

LOPHOGLOSSUS, *Lec. (continued.)*
- strenuus, *Lec.*
- scrutator, *Lec.*

AMARA, *Bon.*
- avida, *Say.*
- lacustris, *Lec.*
- angustata, *Say.*
- impuncticollis, *Say.*
- fallax, *Lec.*
- obesa, *Say.*
- musculus, *Lec.*
- chalcea, *Dej.*

BADISTER, *Clair.*
- notatus, *Hald.*
- pulchellus, *Lec.*
- ferrugineus, *Dej.*

DIPLOCHILA, *Bru.*
- laticollis, *Lec.*
- major, *Lec.*
- impressicollis, *Dej.*
- obtusus, *Lec.*

DICÆLUS, *Bon.*
- dilatatus, *Say.*
- splendidus, *Say.*
- purpuratus, *Bon.*
- sculptilis, *Say.*
- ovalis, *Lec.*
- simplex, *Dej.*
- elongatus, *Dej.*

ANOMOGLOSSUS, *Chaud.*
- emarginatus, *Say.*
- pusillus, *Say.*

CHLÆNIUS, *Bon.*
- aestivus, *Say.*
- erythropus, *Germ.*
- fuscicornis, *Dej.*
- laticollis, *Say.*
- rufipes, *Dej.*
- sericeus, *Fors.*
- prasinus, *Dej.*
- chlorophanus, *Dej.*
- cordicollis, *Kirby.*
- nemoralis, *Say.*
- pensylvanicus, *Say.*
- tricolor, *Dej.*
- brevilabris, *Lec.*
- impunctifrons, *Say.*
- niger, *Rand.*

tomentosus, *Say.*
viduus, *Horn.*
lithophilus, *Say.*

ATRANUS, *Lec.*
pubescens, *Dej.*

ANATRICHIS, *Lec.*
minuta, *Dej.*

OODES, *Bon.*
fluvialis, *Lec.*
americanus, *Dej.*
amaroides, *Dej.*
cupræus, *Chaud.*

GEOPINUS, *Lec.*
incrassatus, *Dej.*

CRATACANTHUS, *Dej.*
dubius, *Beaur.*

AGONODERUS, *Dej.*
lineola, *Dej.*
comma, *Lec.*
pallipes, *Fabr.*
partarius, *Chaud.*

DISCODERUS, *Lec.*
parallelus, *Hald.*

ANISODACTYLUS, *Dej.*
rusticus, *Dej.*
carbonarius, *Say.*
harrisii, *Lec.*
melanopus, *Hald.*
nigrita, *Dej.*
discoideus *Dej.*
baltimorensis, *Say.*
laetus, *Dej.*
coenus, *Say.*
sericeus, *Harris.*

XESTONOTUS, *Lec.*
lugubris, *Dej.*

SPONGOPUS, *Lec.*
verticalis, *Lec.*

AMPHASIA, *Newm.*
interstitialis, *Say.*

EURYTRICHUS, *Lec.*
piceus, *Lec.*
terminatus, *Say.*

GYNANDROPUS, *Dej.*
hylacis, *Say.*

BRADYCELLUS, *Er.*
vulpeculus, *Say.*
badiipennis, *Hald.*
rupestris, *Say.*
tantellus, *Chaud.*

HARPALUS, *Latr.*
gagatinus, *Dej.*
dedicularius, *Dej.*
caliginosus, *Fab.*
testaceus, *Lec.*
erraticus, *Say.*
viridiæneus, *Beaur.*
faunus, *Say.*
pensylvanicus, *De Geer.*
compar, *Lec.*
erythropus, *Dej.*
pleuriticus, *Kirby.*
herbivagus, *Say.*
nitidulus, *Chaud.*
rufimanus, *Lec.*
vagans, *Lec.*

STENOLOPHUS, *Dej*
carbonarius, *Bru.*
fuliginosus, *Dej.*
conjunctus, *Say.*
ochropezus, *Say.*
dissimilis, *Dej.*

PATROBUS, *Dej.*
longicornis, *Say.*

BEMBIDIUM, *Er.*
paludosum, *St.*

inaequale, *Say.*
coxendix, *Say.*
nitidulum, *Dej.*
nitidum, *Kirby.*
americanum, *Dej.*
fugax, *Lec.*
cordatum, *Lec.*
dorsale, *Say.*
patruele, *Dej.*
pictum, *Lec.*
affine, *Say.*
texanum.
frontalis, *Lec.*
4-maculatum, *Linn.*
pedicellatum, *Lec.*
lævigatum, *Say.*

TACHYS, *Ziegl.*
proximus, *Say.*
scitulus, *Lec.*
corruscus, *Lec.*
lævus, *Say.*
nanus, *Gyll.*
flavicauda, *Say.*
capax, *Lec.*
xanthopus, *Dej.*
incurvus, *Say.*
pulchellus, *Ferte.*
dolosus, *Lec.*

PERICOMPSUS, *Lec.*
ephippiatus, *Say.*

(To be Continued.)

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 128.

CLYMENE and CYLLENE.

C. aegerfasciella, ante p. 114, and *C. minutisimella, ante p. 125.*

When the generic and specific characters of these insects were written —more than a year ago—I placed them, with much doubt, among the Micro-Lepidoptera. Subsequent examination has only served to increase those doubts, or rather, has convinced me that they are allied to the *Hydroptilidæ*, and are Trichopterous, if *Hydroptila* is Trichopterous. At the same time, it was partly because I was unable satisfactorily to place them in *Hydroptila*, or any allied genus heretofore described, that I was induced to place them among Micro-Lepidoptera. These minute species of supposed Trichopterous affinities are so little known; the characters of families, genera, and species are so vague; and so much confusion prevails about them, that I take the liberty of suggesting that the *Hydroptilidæ* are more Lepidopterous than Trichopterous or Neuropterous—at

least if these two species are true *Hydroptilidæ*. I am, however, no Trichopterist, and am not competent to decide the question. It seems to me, however, from an examination of such specimens as I have seen, and from such study as I have been able to give to Trichoptera, that they are more nearly allied, for instance, to *Tinea* than to *Phryganea*, that they do not differ from other *Tineina* more than other genera of that family differ from each other, and that they differ from other Trichoptera fully as much as they do from any *Tineina*. I speak only of the imago—for the larvæ of *Clymene* and *Cyllene* are unknown—Trichoptera, and especially *Hydroptila*, seems to me a very heterogeneous assemblage.

Referring the reader to the published accounts of *Clymene* and *Cyllene* on previous pages of this volume, I add the following notes as bearing on their Trichopterous affinities. :—

The most striking character of both species, and that which first suggested doubts of their Lepidopterous affinities, is the clothing. Both are clothed with short stiff or scale-like hairs, instead of true scales, of which I have not been able to denude the wings except by boiling in potash. Many of these hairs are reversed, looking as if brushed backwards; and, in *Clymene* especially, the Patagia are comparatively naked and are clothed with rather long stiff hairs or bristles. I have found both species in the same localities in company with each other and with *Gelechia*, *Lithocolletis* and other true Lepidoptera, resting upon fences and trunks of trees, in the dryest situations to be found in this well watered region. Of *Cyllene* I have dissected both ♂ and ♀; of *Clymene* only the ♀. In both the antennæ are moniliform.

Cyllene.—Anterior tibia spurless; intermediate ones with two apical spurs, one of which is small; posterior with one long median spur, and two short apical ones, one of which is very short. Basal joint of the antennæ small; ocelli none; maxillary palpi 3 (or 4 ?) jointed (if four the basal one is very minute and indistinct), the last joint being slender and longer than either of the others. I was not able to detect the presence of labial palpi, even when the head was severed carefully from the body and boiled over the lamp on a glass slip under the thin glass cover. Anterior wings pointed; posterior wings with the costa excised from before the middle to the tip; cilia long.

Clymene.—Basal joint of the antennæ swollen; ocelli none. In the diagnosis, ante p. 114, I have stated that there is no tongue. This is scarcely correct; there is a minute, conical, fleshy protuberance which I

think is a rudimentary tongue, and on each side of it a smaller and more corneus projection, which I take to be the representatives of the maxillæ. Maxillary palpi three-jointed, the joints simple and of nearly equal length ; labial palpi small, simple, one (or two?) jointed (if two the basal one is minute and indistinct.) Anterior tibia without spurs ; intermediate tibia with one short median, and one short and one long apical spur ; posterior tibia with two median spurs, one of them small, and two rather long apical spurs.

The ciliæ, especially of the hind wings, are very long in both insects. The neuration is obsolete in *Cyllene;* in *Clymene* it resembles closely that of *Hydroptila tineoides* Dalman, as figured by McLachlan in *Trans. Ent. Soc. Lond., Ser. 3, v. 5, plate 5, fig. 7.* Indeed that of the forewings is almost identical, whilst the hind wings differ somewhat both in shape and neuration.

The specific description of *C. aegerfasciella* should be corrected by adding the statement that the hairs around the mouth are dark brown.

By comparing the above account of these insects with McLachlan's account of the family *Hydroptilida* and its two genera, *Agraylea* and *Hydroptila, loc. cit.*, the differences to which I have alluded will be observed.

BUCCULATRIX.

This genus is usually associated with *Lithocolletis* and allied genera ; but the fact that it is an external feeder, except for a very brief period ; the absence of palpi and tongue, and the different neuration of the wings seem to me to remove it from that association.

In addition to the points of structure just mentioned, a Bucculatrix has the basal joint of the antennae expanded, forming an eye-cap which almost conceals the eyes. The face is smooth and there is an erect tuft upon the vertex, and the antennae are nearly as long as the wings.

A—Species having a brownish spot on the dorsal margin of the anterior wings.

* Having an apical spot.

1. *B. trifasciella*, Clemens. *Proc. Ent. Soc. Phila., 1865, p. 147.*

Unknown to me except by Dr. Clemens' description. Wings ochreous with three silvery costal streaks.

2. B. capitealbella. N. sp.

Face and tuft snowy white; antennæ silvery white; anterior wings snowy white, with a few scattered ochreous brown scales about the middle of the basal half. Just before the middle is a pale yellowish costal streak passing obliquely backwards to the middle of the wing and widest on the costa, where it is dusted with brown. A similar but less oblique streak just behind the middle. On the dorsal margin, opposite the space between these streaks, is a rather large yellowish spot internally margined by a small raised patch of dark brown scales. On the base of the costal ciliae is a patch of pale yellowish dusted with brownish; a streak of the same hue around the base of the dorsal ciliae, containing a minute brown spot at the beginning of the ciliae and another at the apex of the wing. Ciliae white, flecked with brownish at the extreme tip.

Alar ex. a little over ¼ inch. A single specimen taken in Kentucky. Larva and food plant unknown.

3. B. pomifoliella, Clem. *Proc. Acad. Nat. Sci,, Phila., 1860, p. 211.*

This is our commonest species. It feeds on the leaves of Apple trees. Wings whitish dusted with brown. A brownish costal streak widest on the costa passes obliquely across the wing to the dorsal ciliae.

* * No apical spot.

4. B. obscurafasciella. N. sp.

Face yellowish white; tuft reddish orange, becoming almost rufous on top; antennae yellowish silvery, dotted with brown above; anterior wings pale golden at the base, deepening towards the apex, with two tolerably distinct but not well defined costal white spots or streaks before the middle, the first continuing as a very indistinct band obliquely across the wing and slightly angulated posteriorly near the dorsal margin, where it is bounded behind by a distinct dark brown spot containing raised scales. At near the apical third is an indistinct whitish fascia with a few dark brown scales before it on and near the costa. Ciliae pale stramineous. Apex and ciliae sparsely flecked with pale fuscous. A dark brown hinder marginal line in the ciliae. Under surface and legs yellowish silvery with the anterior surface of the tarsi annulate with fuscous. *Alar ex.* about ¼ inch. Larva and food plant unknown. Captured May 23rd.

Dr. Clemens' description of his *B. coronatella* seems to resemble this insect, except that he does not mention the dorsal spot and the 1st fascia is represented in that species by a costal and opposite dorsal spots.

5. B. luteella. N. sp.

Face, tuft and antennae white; thorax and anterior wings pale creamy white suffused with pale orange, which in some places is condensed into blotches or bands; sparsely dusted with pale fuscous, and with a very small patch of raised scales about the middle of the inner margin of the anterior wings. Ciliae stramineous. *Alar ex.* ¼ inch. Kentucky. Larva and food plant unknown. Captured in March.

6. B. agnella. Clem., *loc. cit.*

Wings whitish, washed with luteous brown, especially towards the tip. Costa dark fuscous from the base, giving off about the middle a short fuscous streak. Imago in May. Unknown to me except by Dr. Clemens' description.

B—No dorsal spot.

7. B. Packardella. N. sp.

Face and eye-caps white, lower portion of the face tinged with pale golden, sparsely flecked with pale brownish. Tuft white below, tipped above with yellowish and brownish. Antennae pale yellowish, dotted with brown. Thorax white, well dusted with brown, and *with a small brown spot on each side near the apex.* Wings, basal half white flecked with brown, faintly streaked with orange chrome upon the fold, and with a narrow line of the same along the costal margin flecked with brownish and widening towards the middle, whence it spreads over the apical half of the wing, which is a decided orange chrome, with a short, faint, narrow curved white streak running through it from the middle of the wing to the base of the dorsal ciliae, and a small oblique white streak about the middle of the apical portion of the wing, which is dusted with brownish along the costa, and in the ciliae forming an approach to two hinder marginal lines in the ciliae, which are yellowish stramineous. *Alar ex.* ¼ inch. Larva and food plant unknown. Taken in April.

8. B. coronatella, Clem. *Proc. Acad. Nat. Sci., Phila., 1860, p. 13.*

Unknown to me except from the description of Dr. Clemens. See *B. obscuro-fasciella, ante.*

9. B. Thuiella? Packard.

Unknown to me except from the figure in the "American Naturalist," v. 5, p. 427, which does not indicate a dorsal nor an apical spot, though Dr. Packard says that it resembles *B. pomifoliella.* I place it doubtfully in this section.

These, I believe, are the only described American species.

CORRESPONDENCE.

MONTRRAL, JULY 14TH, 1873.

DEAR SIR,—

I should like to be informed how to distinguish the sexes of moths and butterflies when there is no dissimilarity in the markings of the wings, &c.; also, how to distinguish *A. cybele* from *A. aphrodite*, and also to recognize *A. atlantis* and *A. montinus*, as in Harris they are not described at all, and Packard only mentions their names. I should also like to know how to preserve spiders and bugs, &c., in the best way.

Yours, &c.,
H. H. L., Montreal, P. Q.

In the larger moths the sexes may be distinguished frequently by the structure of the antennæ, they being more widely pectinate in the male than in the female. Where no distinguishing features of this kind present themselves, the relative size of the bodies will enable one to decide this matter, the bodies of the females being usually distended with eggs. A more accurate method would be to examine the character of the generative organs, for the structure of which we would refer our correspondent to Packard's Guide, p. 16, 170, 237.

In answer to the queries relating to *cybele, aphrodite* and *atlantis*, we quote the following from that excellent work of Mr. W. H. Edwards': "The Butterflies of North America":—

"Cybele is the larger, and the difference in color between the sexes is much less than in Aphrodite. In the latter the male is much smaller in proportion to the female, is brighter colored than Cybele, and has very little brown at base of wings. The black markings are noticeably more

delicate, the marginal lines on primaries nearer together, more or less excluding the fulvous spots which, in Cybele, are distinct along the whole margin. The margin of secondaries also has an edge line like the primaries; the median band is formed of small crescents, separated by wide spaces and obsolete on costal margin; and there is no black space between the costal and subcostal as in Cybele. On the under side the silver marginal and costal spots are decided, while in Cybele they are usually wanting, or indicated by a few scales only; the basal color of secondaries is cinnamon-brown, and the band is more or less encroached on by the ground color; the pyriform spot of third row is cut by the arc as in Cybele, but the smaller spot thus made is edged above with black and is in effect a distinct spot. Comparing the females, Cybele is luteous, very dark at base, heavily marked with black. Aphrodite is suffused with a rich red tint that seems as if in the very texture of the wing, and that makes living specimens conspicuous; the under side of primaries is red fulvous, of secondaries deep ferruginous, and the band is almost wholly crowded out."

"Atlantis is readily distinguished from Aphrodite by its smaller size, duller color, broad black margins, confluent median band of secondaries and color of same wings below; also by the longer and narrower fore wings."

Spiders may be preserved in diluted alcohol in bottles. Bugs *(Hemiptera)* are pinned in the usual way.

We received from our esteemed correspondent, W. H. Edwards, Esq., a few days since, a letter in which he informed us that he had received from Labrador, from Mr. Wm. Couper, specimens of a Papilio which has already been several times referred to in our journal. With the writer's consent we have much pleasure in inserting the following note, which has just come to hand.—Ed. C. E.

Coalburgh, W. Va., 24th Aug., 1873.

Dear Sir,—

I have taken the Papilio's from Anticosti from drying blocks, and have compared with all the allied species that I had with me; also, have compared with the description of Brevicauda, Saunders, and I have no doubt that the species is a good one and its name is Brevicauda. It is allied to Zolicaon and Machaon.

But the above is seen to differ in this, that the hind wings are black from base to yellow band beyond the cell, while in all the others named the color of that section of the wing is yellow. Also, the body is black spotted with yellow, in longitudinal lines, as in Asterias, while in the before named species the wings are black with yellow stripes, not spots. There are other differences, but these are enough to mention.

The yellow spots of Brevicauda are replaced with fulvous to a remarkable extent, but that peculiarity is not unusual in the group, nor in the Asterias group. These specimens from Anticosti differ greatly in this respect, though in all I have seen the fulvous is confined to the lower side. They also differ in length of tail, though the longest is short compared with the average Asterias.

Yours truly,

W. H. EDWARDS.

MISCELLANEOUS.

TENT CATERPILLARS *(Clisiocampa).*—These pests were very numerous here this season, swarming on the trees of both orchard and forest. I observed one Thorn tree on Montreal Mountain that had been completely stripped of its leaves by them, leaving nothing but a few old webs that one might fancy were banners left to mark the path of a victorious army. A little farther on I found another horde encamped upon two Thorn trees that were growing one on each side of a large rock; not finding the leaves of the tree on which their parent had placed them to their taste, they made a path across the rock to the tree at the other side, and upon which they climbed by two or three leaves that rested against the edge of the rock. Now, if it had not been for the leaves touching the rock the caterpillars would have had to crawl down one tree and up the other whenever they needed food, and their instinct seemed to have taught them so, for although the whole nestful of hungry caterpillars crossed the leaves every time they went to feed, not one of them attempted to eat their bridge, but passed farther on before commencing their meal. In former seasons any of these caterpillars that I observed spinning up, chose the shelter of a fence or crevices in bark or some such place to make their cocoons in, but this season I found them rolling up leaves and making their cocoons inside them, and in some cases I found two cocoons in the same leaf. I found them spun up in almost every kind of leaf, Linden,

Oak, Maple, Butternut, Thorn, Sweet Briar, Asclepias, Fern, &c. On Asclepias and Fern they only rolled one edge of the leaf, and sometimes spun up on the leaf exposed without any covering. I also found several spun between stalks of grass, indeed they selected some most extraordinary places, for a friend of mine showed me one in a bird's nest. The nest was built in a Fir tree and contained four eggs, over which the cocoon was spun and attached firmly to the sides of the nest; it would not have been so strange if the nest had been on any of its food plants and built low down, but this was on a Fir tree and a good highth from the ground. I suppose it may be set down as one of the freaks of Nature. I selected cocoons from leaves of various trees and plants, and all of them proved to be *Clisiocampa sylvatica*, Harris.

RARE CAPTURES.—*Debis portlandia.*—I found a locality for this butterfly in a sunny opening in a wood at Lachine, nine miles west of this city.

Erebus odora, Cram.—I received a specimen of this splendid moth, taken in this city in July of this year. It was attracted into a room by light. I believe this is the farthest north that it has been taken. Both these species were kindly determined for me by Mr. Herman Strecker, of Reading, Pa.—FRANK B. CAULFIELD, Montreal, P. Q.

REDUVIUS RAPTATORIUS.—One night at the end of April I caught one of these swift-footed insects, and while holding it between my finger and thumb it managed to insert its proboscis into the latter member and gave me, much to my surprise and disgust, a most savage sting. The pain was very great—much more than that caused by a mosquito, and it continued for about five days, although the thumb did not swell. I put the *R. R.* into a jar of water in which, for a fortnight, I had been keeping a large water-beetle *(Dytiscus)*, feeding it with flies, ectobias and other insects; but this Hemiptera was too much for the poor beetle. It refused to be quietly killed and eaten, but instead, pierced the hard shell which in the morning was floating dead upon the water, while the victor still lived. The mode of the beetles's attacking its prey was very interesting; it would make a sudden dash, seize the quarry with its strong mandibles, then dive down and swim about beneath the surface as if to drown its victim; then after a time it would rise to the top and there quietly crunch up its food, discarding the wings as too dry eating.—R. V. ROGERS, Kingston.

VENEMOUS CATERPILLARS.—Mr. R. Benson, of Madras, India, gives the following account, in a recent number of *Nature*, of pain inflicted by a caterpillar:—"In 1868, when travelling in company with Capt. Street in

the Burmese forests on a botanical trip, and whilst in the act of detatching a specimen plant of *Dendrobium farmerii* from the naked branch of a tree, I felt a severe and painful sting on my thumb. On examination I noticed I had seized hold of a large caterpillar, lodged amongst the roots of this orchid. It was about two inches long, clothed with erect hairs; its colour was a reddish brown, the lower part of the abdomen being darker, with well-developed legs. My thumb continued painful for three days; it was considerably swollen, the skin having a drawn glazed appearance. The Burmese told me that this kind of caterpillar was exceedingly venemous, and one fellow was particularly consoling by informing me that unless the pain subsided in three days the sting might prove fatal. I am inclined to think that the caterpillar for self-protection has the power of detaching these hairs; whether any propelling force is present at the time of detachment it would be difficult to prove. I found steeping my hand in Eau de Cologne gave me the greatest relief."

MR. ALBERT MULLER communicated the following notes at a meeting of the Ent. Soc. of London, England :—

1. *Arœocerus coffeæ at Basle.*—"On the 29th of September, 1862, while attentively watching the unpacking of some freshly-imported bags of Java coffee, in a warehouse at Basle, a very lively specimen of this beetle came tumbling out of one of the bags. I secured it and kept it alive for some days. In a letter dated the 14th of March, 1873, which I have just received from my lynx-eyed friend Herr H. Knecht, of the same city, he tells me that he can now get this species in any quantity at Basle. It is well known that this species of Anthribidæ feeds in the larval state on raw coffee-berries; hence its introduction and capture in commercial emporia on the coasts of different continents need cause little surprise; but the two facts here recorded illustrate once more the indubitable axiom that insects living on merchandise are spread chiefly along the main trade-route, and become acclimatised along their whole course, Basle being one of the chief markets where Central Europe stores and disposes of the purchases derived from Mediterranean and Atlantic ports."

2. *Tribolium ferrugineum in Ground-nuts.*—"In the summer of 1863 a cargo of ground-nuts *(Arachis hypogœa)* arrived in the port of London direct from Sierra Leone. On arrival the usual samples were drawn, when it turned out that the husks were riddled by countless holes, while the

kernels were half eaten up by myriads of larvæ and imagines of Tribolium ferrugineum. So completely had they done their noisome work that in the numerous samples examined scarcely an intact kernel could be found. If a nut was opened the whole interior was often found to be converted into a living conglomerate of larvæ, pupæ and imagines of Tribolium accompanied by the larvæ and perfect insects of a Rhizophagus preying on the former, the whole mass being wrapped up in a layer of cast-skins and excrement. As no purchaser could be found, owing to the deplorable state of the cargo, the work of destruction continued through the months of August, September and October, the owners being unwillingto take a considerably lower price than had been calculated upon. A fresh proof how the marketable value of an article can become reduced through delay and ignorance on the part of its owner."—*The Zoologist.*

THE WAXY EXUDATION OF HOMOPTERA.—An exudation, corresponding to that which is characteristic of Aphis Fagi, is common to all the several thousand species of Homopterous insects, and appears more or less, and in various forms, throughout the tribes, from the singing Cicada to the stationary Coccus, and often serves as a defence. In Cicada it is slight and powdery; in some of the tribe, of which the lantern-flies are the most conspicuous representatives, it is excessive, and forms waxy filaments which surpass the body in length. It hardly appears as an emanation from the frog-hoppers; but in the next family, or Psyllidæ, it may be often witnessed in gardens by the multitude of white flecks which proceed from Psylla Buxi on the box-trees, and fall in showers when the branches are shaken. Next come the Aphides, of which the types are distinguished by two pipes, whence the streams of honey flow. The beech Aphis, or A. Fagi, is less typical and less multiplying than many others, and is more sheltered than them from the oviposition of Aphidius by the fleecy or gummy substance which it emits. The American blight, which belongs to this family, is defended by the abundance of its cottony covering. The wax-insect, or Coccus of China, has been mentioned in several books, and a Coccus in Arabia produces a substance which is called manna, and is supposed by some persons to be identical with the manna in the wilderness.—*Francis Walker, in Newman's Entomologist.*

THE COLORADO POTATO BEETLE VARYING ITS FOOD.—A generally received opinion in regard to the Colorado Potato Beetle, *Doryphora 10-lineata* (Say), is that its food is confined to plants of the family Solanaceæ. I have found it this season (June 19, 1872) at Port Austin,

Michigan, sparingly feeding on grass, on which it had also deposited its eggs. Later in the season (July 20), at Fort Gratiot, Michigan, I encountered it in large numbers, in both the larva and perfect states, in the vicinity of potato fields (where it had committed terrible depredations), devouring the younger leaves and flower buds of the common thistle (*Cirsium lanceolatum*, Scop.), which it was rapidly stripping even to its thick stem so that the entire top of the plant hung down, almost severed. In the same neighborhood I also saw it on pigweed (*Amarantus retroflexus* L.), hedge mustard (*Sisymbrium officinale* Scop.), the cultivated oat, smart-weed (*Polygonum hydropiper* L.), and the red currant and tomato of the gardens, as well as the common night-shade (*Solanum nigrum* L.), the last two its more legitimate food. But of the last mentioned plants, with the exception of the night-shade, it ate only the young leaves, and of them very sparingly. The thistle it seemed particularly to relish. Could its attention be diverted from the potato to the Canada thistle it would encounter an object worthy of its prowess; and the curses which have been heaped upon its striped back would be turned to blessings. But, I fear, little good can be hoped from the capacity, thus evinced, to diversify its food, and so accommodate itself to circumstances. This can only be regarded as another obstacle in the way of its extermination.

Since writing the above I have found the beetle feeding on the maple-leaved goosefoot (*Chenopodium hybridum* L.), lamb's quarters (*C. album* L.), and thoroughwort (*Eupatorium perfoliatum* L.); and August 8, 1872, I saw it in the larva and perfect states, voraciously eating the black henbane (*Hyosciamus niger* L.), on which was also to be seen an abundance of the eggs.—HENRY GILLMAN, Detroit, Michigan, September, 1872, *in American Naturalist.*

THE ANT-LION.—While in the Indian Ladder Region, Albany Co., N. Y., in August, 1871, I found a large colony of ant-lions. It is situated near the head of the "Ladder Road," at the base of the cliffs and extends for several rods along the path to the "Tory House." The cliffs here hang over the paths, so that it is almost impossible for rain to reach the spot. The soil is composed of disintegrated limestone, extremely fine, but mingled with minute fragments of stone as well as larger pebbles.

In Aug., 1871, the colony numbered rather more than 600 individuals, but on July 6, 1872, there were scarcely half that number. Perhaps at

this last date some were in the chrysalis, as of several specimens thus obtained most of them entered that state in a short time, while those taken in August remained until the following spring.

Food was very scarce in this colony, as it was rare to see more than four or five victims in the lions' dens at one time. On several occasions I noticed a strong and active insect, having ventured over the edge of the pit, run swiftly down and up the other side, leaving the ant-lion wildly snapping its jaws, as the intended victim mounted the steep side of the pitfall.

The ant-lion does not, as far as my observation goes, throw up sand to bring down its prey, but throws it up in every direction in order to keep its jaws free to seize the insect when it reaches the bottom of the den.

In 1871 there was another colony (which I did not visit in 1872) near the "Paint Mine." It consisted of some 300 members. I call it a colony, although, of course, there was no friendly intercourse between the inhabitants of the settlement. On the other hand, in the most crowded portions, the chief employment of the insects was to throw out the dirt which their active neighbors were depositing on their own premises.—E. A. Birge, Williams College, in *American Naturalist.*

Destruction of Dragon-flies by Birds.—Mr. Gould, in a communication to the Entomological Society of London, says, "I believe that the larger dragon-flies are very liable to the attacks of birds, and have no doubt that the hobby and kestrel occasionally feed upon them; with regard to the small blue-bodied species (Agrionidæ) frequenting the sedgy bank of the Thames, I have seen smaller birds, sparrows, etc., capture and eat them before my eyes, after having carefully nipped off the wings, which are not swallowed. This must take place to a considerable extent, as I have observed the tow-path strewn with the rejected wings."—This has been observed by Mr. J. L. Hersey of New Hampshire (see the following note):—Eds.

Bees and King-birds.—For the last ten years I have carefully noted the habits and movements of the king-birds, and have come to the following conclusion, viz.: that they do eat the honey bee, and so does the purple martin; but instead of being destroyed for it, they should be protected and allowed to build their nests near the farm-house, because they drive off the hawks, crows and other plundering birds from the

poultry yard. Warm afternoons in July and August, when the drone bees are out, we have seen the martins come down within ten feet of the hive and snap up the drone bees, thus relieving the workers from the necessity of expelling them from the hive and biting off their wings to prevent them from getting back to the hive. The king-bird also, we find, selects the drone, and will come afternoons and take his position on a stake in front of the hive, and when a drone bee comes along will make a rush for him, come back to the stake, give him a pick or two and swallow him. But says an objector, "What do they subsist on before the drone bees fly out?" This point I settled by shooting one in the month of May, and I found in his crop the wings and legs of May-bugs. By watching their movements, I find the dragon-fly is also a favorite food for them.—J. L. HERSEY, *American Bee Journal.*

AGRICULTURAL ANTS.—Mr. Moggridge has observed at Menton, France, two species of ants (*Aphenogaster*) carrying into their nests, during the winter months, the seeds of certain late fruiting plants. He has traced their burrows to a spherical chamber filled with the seed of a grass which he had seen the ants in the act of transporting. "Outside the channels there was generally a heap of the husks of the various seeds, and sometimes one of those heaps would fill a quart measure. These husks had had their farinaceous contents extracted through a hole in one side. He purposely strewed near the nests large quantities of millet and hemp seeds. After the lapse of a fortnight many of these seeds, previously conveyed into the nests, had been brought out again, they having evidently commenced to germinate, and he then found that the radicle was gnawed off from each seed, so as to prevent further growth, and, this being effected, the seeds were carried back again. The cotyledons of germinated seeds were removed from the nest."—*Trans. Entomological Society of London, 1871.*

ADVERTISEMENTS.

EXCHANGE.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. WASSERMAN, Beverly Terrace, Cullercoats, North Shields, England.

COLEOPTERA FOR SALE.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by JOHN AKHURST, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

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ON THE GENUS CATOCALA.

BY AUG. R. GROTE., BUFFALO, N. Y.

Catocala Meskei, Grote.

Forewings dentate, pulverulent, of a rather lighter grey than *C. unijuga*. Median lines black, single, not very distinct. A whitish space before the large bisannulate concolorous reniform ; sub-reniform likewise whitish, closed, joined to the t. p. line, the latter jagged but without very prominent discal teeth, making a deeper and narrower sinus above vein than in *C. unijuga*. Subterminal upright, dentate, shade (preceding the blackish line) distinct. Terminal line appearing as black lunulated interspaceal marks. Hind wings bright red, somewhat pinkish. The black median band is straight, not regularly curved as in *C. parta*, and straighter than in *C. unijuga*, rather narrow, nowhere greatly excavate, rounding and narrower on the interspace between veins 1 and 2 opposite the excavation of the marginal band, arrested at vein 1, but a few blackish scales mark its continuance towards internal margin. Marginal band narrower than in *C. unijuga*. Ciliæ white, with a few red scales at base, especially at apices. Beneath the median band of the hind wings is narrower than above, with the same peculiarities, constricted at veins 2 and 5, and continued by scattered scales beyond vein 1. Expanse 78 m. m.

Lent me by Mr. O. Meske, after whom I name the species, from near Albany, N. Y., and who writes me that it has been taken in considerable numbers by a collector in that vicinity.

NOTE 1.—Mr. Walker's description of *C. junctura* applies to the secondaries of *C. meskei*, but the color is not "red lead, orange-red towards the base," nor is there any "large elongated apical spot," nor

"red marginal lunules." The fore wings are also very evidently different in tint and color of median spots, while from my recollection of Mr. Walker's type, it was much nearer *C. unijuga* than the present species seems to be.

NOTE 2.—In looking over my paper on this genus, in the Transactions of the American Entomological Society, I find that I have stated in reference to *C. nebulosa*, that "Mr. Edwards compares the secondaries of this species quite wrongly with *C. cerogama*." In reality, Mr. Edwards nowhere directly alludes to *C. cerogama*. I should have written that Mr. Edwards describes the secondaries in such a manner as to lead one to suppose that he intended a species resembling *C. cerogama*, and my idea is correctly expressed in my original description of *C. ponderosa*. I am sorry that in repeating my idea from memory, without referring to former papers, I should have used words not in literal accordance with the facts.

NOTE 3.—The median band of the hind wings in *C. parta* is curved, and occasionally a few dark scales are visible along the cross vein above. Darker specimens of *C. parta*, exhibiting every peculiarity of the species, the apical streak, characters of the hind wings, etc., have occurred about Buffalo with the paler, more usual specimens, and seem to be Mr. Strecker's "nov. ? var." *perplexa*; it seems to me that an assumption of bastardy is unnecessary to account for so slight a variation. Mr. Strecker's statement that M. Guenee mistook *C. relicta* for *C. fraxini* must be based on an erroneous comprehension of my quotation of that author. So excellent an Entomologist as M. Guenee could not have made such an error. *Fraxini* was doubtless sent him with an erroneous locality. M. Guenee always shows an appreciation of the slightest differences in separating European and American specimens throughout his great work, and here the difference is excessive. Occasionally we see *Acherontia atropos* incorrectly referred to as occurring in America, nor can in this case any of our Sphingidæ have been mistaken for it. Mr. Strecker criticises the coloring of *subnata*; this plate was published plain and drawn without being intended for coloring; the few copies colored for private distribution are not properly the subject of public criticism. Mr. Strecker's figures, however, *are*, and the coloring of the hind wings of *antinympha*, fig. 7, and *unijuga*, fig. 9, is so bad that I should doubt his determinations were it not that he has taken his information from the collection of the American Entomological Society, which represents my identifications.

NOTE 4.—*Catocala Walshii*, Edwards, is still unknown to me. I believe the types perished in the Chicago fire. It must be nearly allied to *unijuga*. Mr. Edwards' description of the fore wings, "Primaries yellowish brown, clouded between the transverse lines with grey; markings indistinct, but similar to *Uniguga*, Walk; reniform ferruginous, in a pale circlet," is not exhaustive, but it contains nothing contradicting Walker's description of *C. junctura*.

Catocala Arizonæ, Grote.

Size large. Fore wings dentate, rather uniformly dark grayish brown with a glaucous shade over the more grayish median space. Median lines black and rather broad. A whitish shade before the brown-tinged, broadly bisannulate reniform. Sub-reniform rather small, pyriform, whitish brown, connected with the t. p. line, tending to become narrowly open. T. p. line well produced opposite the cell, with two sub-equal rather prominent teeth. A not very deep but broadly marked sub-median sinus. The dark scales tend to connect with the t. a. line along the sub-median interspace. The grey sub-terminal shade, preceding the dentate dark line itself, is not erect, but runs obliquely backward to costa above vein 6. Secondaries pinkish red. Median band rather narrow, not much curved, nearly even, rounding and becoming narrower below vein 2, and terminating at vein 1. Marginal band rather narrow, rather deeply excavate opposite the termination of the median band, and leaving a yellowish apical space tinged with red. Beneath largely pinkish red; the median whitish space on primaries also tinged with red inferiorly. The median band as on upper surface, and seen to terminate a very little before vein 1. Thorax and collar brownish, without perceptible lines. Expanse 80 m. m.

I have received this species from Professor Townend Glover, of the Agricultural Department at Washington. It is labelled "Borders of Arizona and New Mexico.—Dr. Palmer." It is apparently nearest to *C. amatrix*, than which it has more obscurely brown primaries and is perhaps intermediate in character between the group of *C. amatrix* and the Californian red-winged species, represented by *C. californica*.

NOTE.—In my list of the species of *Catocala*, p. 164, 1872, I enumerated 59 species of the genus from our Territory. The total number must be now increased to 63. Of these 11, viz., *Stretchii* Behr., *adultera* Hinze, *irene* Behr., *Walshii* Edwards, *uxor* Guenee, *zoe* Behr.,

nuptialis Walker, *micronympha* Guenee, *connubialis* Guenee, *messalina* Guenee, and Mr. Strecker's *Faustina*, are unknown to me in nature. Already twice the number of species of *Catocala* have been discovered in America than have been described from Europe. The genus does not occur south of Mexico, and has not been discovered in the West India Islands.

NOTES ON AN INTERESTING SPECIMEN OF PAMPHILA ZABULON, Boisd & Lec.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

The identity of *Pamphila pocahontas* and *quadaquina* with the typical species *zabulon* has been universally acknowledged, although there exists no more positive proof than the fact that no males of these forms have ever been discovered. I have in my collection an intermediate specimen exhibiting plainly the characters of the original species and of the variety and sub-variety, and apparently a link between them.

The primaries above are like *pocahontas*, except that the spots are a little larger and of a deeper yellow. The secondaries above are exactly the same as in *zabulon*, dark at the base, disk yellow, with a broad black border. Beneath the spots on the primaries are united together, forming a band almost as wide, and of as deep a color as in *zabulon*. Secondaries beneath like *quadaquina*, except that the central light band is hardly as narrow.

As will be seen from the description, the primaries beneath the secondaries above resemble *zabulon*, the primaries above *pocahontas*, and the secondaries beneath *quadaquina*, making the specimen a curious compound of all three.

It is a female, and was taken near Springfield, Mass.

MEETING OF THE AMERICAN ASSOCIATION FOR 1873.

FROM P. R. UHLER, BALTIMORE, MD.

The late meeting of the American Association for the Advancement of Science, held at Portland, Me., was largely attended by the Entomologists of the United States. Thirteen were present, and among them were some of the most eminent in this country. Indeed, Section B. was chiefly officered by Entomologists, Dr. LeConte being Chairman and Mr. Scudder Secretary; while, during the last three days of the session, Rev. Dr. Morris presided over the sub-section Biology, and Mr. Grote acted as Secretary.

On three of the evenings (August 21, 22, 23) the Entomologists held meetings in one of the smaller rooms of the City Hall; Dr. LeConte being chosen to preside, and Mr. Uhler to act as Secretary. As steps had been taken at a previous meeting of the Association to enable the Entomologists to form a sub-section, this subject was reconsidered, but the number of Entomological papers offered being so small, it was not then deemed advisable to go into sub-section.

The following petition was unanimously adopted and signed by all present, to be presented to the American Entomological Society and to the Canadian Entomological Society :—

"We, the undersigned, Entomologists assembled at the 22nd meeting "of the Amer. Assoc. for the Advance. of Science, held at Portland, "hereby respectfully petition the American Entomological Society of "Philadelphia, and the Entomological Society of Canada, to appoint "yearly meetings to be held at the same times and places with the annual "meetings of the American Association. The undersigned are moved to "this memorial from the considerations that such prospective action of "the Societies would ensure the annual assemblage of a large number of "Entomologists resident over a wide extent of territory, and also prac-"tically enlarge the sphere and increase the usefulness of these "Societies."

The following resolution in reference to the above was also recommended by the Standing Committee of the American Association, and adopted:—

"Resolved, That the American Association for the Advancement of "Science hereby endorses the accompanying memorial, and invites the "Entomological Societies to call yearly meetings of their members, in "accordance with the request therein contained."

Mr. Riley, from the Committee appointed a year ago on Nomenclature, requested that in view of the absence of some of its members, the Committee be dismissed. On motion a new Committee was appointed, consisting of Messrs. Edwards, Scudder, Riley, Bethune, and LeConte, to report at the next annual meeting of the American Association, a code of rules, to be discussed and adopted at said meeting, regarding a uniform nomenclature for the guidance of American Entomologists.

Several Entomological papers were read before Section B. of the American Association; one being by Mr. Grote, entitled "Remarks on the Origin of Insects, and on the Antennal Characters in the Butterflies and Moths;" another by Dr. J. L. LeConte, "Hints for the Promotion of Economic Entomology in the United States;" a third by P. R. Uhler "On a Remarkable Group of Wasps' Nests Found in a Hollow Stump in Maryland;" a fourth by Cyrus Thomas, "On the Identity of the Locust of the Prophet Joel with the *Oedipoda migratoria* of Europe," and a fifth by W. L. Coffinberry, "On Spiders."

The meeting was a very pleasant one to the Entomologists, and enabled them not only to freely exchange opinions respecting subjects of wide spread interest, but also to get a glance at the interesting Fauna of the regions which they visited.

THE LAW OF PRIORITY IN NOMENCLATURE.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

In a recent article in the ENTOMOLOGIST it is proposed to obviate the confusion in which our nomenclature is involved, by accepting the names most generally in use and allowing the law of priority (if it does not make too much trouble!) to determine all questions which may hereafter come up; ignoring entirely the claims of older authors and of writers holding different opinions from the proposers of the scheme. This

proposal, notwithstanding its arbitrary and unscientific character, and its injustice to other Entomologists, would perhaps be accepted by those who have more regard for present convenience than for the establishment of a solid foundation for Entomological Science. Unfortunately, however, the proposition, although at first view practicable, leaves the matter exactly where it stood before.

Where is the authority that will be accepted by everyone when that authority is governed, not by those fixed laws which should determine questions of scientific nomenclature, but by individual opinion, the convenience of some particular class, or of the present generation of students? Surely Mr. Mead does not intend, as would be inferred from his article in the June number of the ENTOMOLOGIST, that we should accept the most recent names, or those which, having been published in this country or by some well-known author, are more familiar to or more generally in use among American naturalists.

There are a few species, which from the excellence of their original description and plates, or from their recent publication, have no synonymy; these are the only species which can be properly considered as accepted *by all* (if we reject priority.)

All that the friends of priority ask is that it should be allowed to decide between names already *in use*. Allowing that the term "in use" should be applied in science to any name attached to a recognizable description, published in a work which is or has been on sale; names which are advanced in pamphlets printed for the private use of the author, and only distributed among his friends; and in state agricultural reports not for sale (except at second hand) can not be considered as published at all.

To determine whether a description is recognizable or not is a matter of much more difficulty, for here the judgment of individual students would be likely to differ very much. We do not believe that every name advanced by the older authors, often with but a line or two of loose description, or a plate giving only a general idea of form and color, should be retained. We do think, however, that whenever there exists a valid description, the law of priority should take its course. In some cases in which the description is not definite enough to determine the species, but there exist authenticated types; and in those cases in which the species is

not fully described by the author, but is afterward limited and restricted by other writers previous to the publication of synonyms, we think the law of priority should apply.

The supporters of the law of priority do not so much insist upon its application in those few cases in which opinion as to the validity of the description is denied, as upon its being taken as the acknowledged guide in the great majority of cases in which recognizable descriptions are attached to both names.

The difference between the catalogue of Mr. Kirby and that of Dr. Staudinger is easily explained.

Dr. Staudinger may have adopted priority in some cases, but he certainly has not in all. For instance, he has not in several cases recognized the names of Fourcroy, Scopoli, Bergstrasser and others. The differing degree of strictness with which the law was carried out, is sufficient to explain the discrepancy in the catalogues.

To be effective, priority must be rigidly enforced. The advantages to be gained by the universal adoption of this law are so great to us, and more especially to the future Entomologist, that the drawbacks, formidable at first, but steadily decreasing with time, can, it seems to us, offer but slight resistance to its entire acceptation.

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

(Continued from Page 147.)

DYTISCIDÆ.

CNEMIDOTUS, *Illig.*
12-punctatus, *Aube.*
HYDROPORUS, *Clairv.*
hybridus, *Lec.*
imbelus, *Lec.*
HYDROPORUS, *Clairv. (continued.)*
pratruelis, *Lec.*
moestus, *Aube.*
lacustris, *Say.*
notus, *Lec.*

HYDROPORUS, *Clairv. (continued.)*
undulatus, *Say.*
sericeus, *Lec.*
lineolatus, *Lec.*
dispar, *Lec.*
impressus, *Lec.*
nubilus, *Lec.*
HYDROCANTHUS, *Say.*
atripennis, *Say.*
LACCOPHILUS, *Leach.*
maculosus, *Say.*
fasciatus, *Aube.*
COPTOTOMUS, *Aube.*
interrogatus, *Fabr.*
MATUS, *Aube.*
bicarinatus, *Say.*
COLYMBETIS, *Clairv.*
biguttulus, *Germ.*
COLYMBETIS, *Clairv. (continued.)*
binotatus, *Harr.*
AGABUS, *Leach.*
punctatus, *Aube.*
taeniolatus, *Lec.*
semivittatus, *Lec.*
ambiguus, *Lec.*
HYDATICUS, *Leach.*
basillaris, *Lec.*
ornaticollis, *Lec.*
fascicollis, *Harr.*
ACILIUS, *Leach.*
fraternus, *Lec.*
DYTISCUS, *Linn.*
fasciventris, *Say.*
CYBISTER, *Linn.*
fimbriolatus, *Mels.*

GYRINIDÆ.

GYRINUS, *Linn.*
affinis, *Aube.*
analis, *Say.*
pernitidus, *Lec.*
DINEUTUS, *McLeay.*
americanus, *Say.*
discolor, *Aube.*

HYDROPHILIDÆ.

HELOPHORUS, *Fabr.*
lineatus, *Say.*
scaber, *Lec.*
HYDROCHUS, *Germ.*
scabratus, *Muls.*
simplex, *Lec.*
impressus, *Zimm.*
HYDROPHILUS, *Geoffr.*
ovalis, *Ziegl.*
triangularis, *Say.*
nimbatus, *Say.*
striolatus, *Lec.*
sublaevis, *Lec.*
HYDROPHILUS, *Geoffr. (continued.)*
glaber, *Hbst.*
HYDROCHARIS, *Latr.*
obtusatus, *Lec.*
BEROSUS, *Leach.*
miles, *Lec.*
pantherinus, *Lec.*
infuscatus, *Lec.*
exiguus, *Lec.*
bimaculatus, *Lec.*
penguia, *Lec.*
tomentarius, *Lec.*

PHILHYDRUS, *Sol.*
cinctus, *Lec.*
perplexus, *Lec.*
maculicollis, *Muls.*
ochraceus, *Mels.*
pygmæus, *Fab.*
HYDROBIUS, *Leach.*
regularis, *Lec.*

CYCLONOTUM, *Er.*
estriatum, *Er.*
CERCYON, *Leach.*
flavipes, *Er.*
limbatum, *Mann.*
centrimaculatum (var.) *Er.*

SILPHIDÆ.

NECROPHORUS, *Fab.*
marginatus, *Fab.*
americanus, *Oliv.*
pustulatus, *Hersch.*
velutinus, *Fab.*
SILPHA, *Linn.*
surinamensis, *Fab.*
marginalis, *Fab.*
inæqualis, *Fab.*

SILPHA, *Linn. (continued.)*
peltata, *Lec.*
var. terminatum, *Kirby.*
var. affine, *Kirby.*
CATOPS, *Fab.*
opacus, *Say.*
SERICODERUS.
flavidus.

SCYDMÆNIDÆ.

MICROSTEMMA, *Motsch.*
lecontei, *Motsch.*

SCYDMÆNUS.
capillosulus, *Lec.*

PSELAPHIDÆ.

CEOPHYLLUS, *Lec.*
monilis, *Lec.*
CTENISTES, *Reiche.*
piceus, *Lec.*
zimmermanii, *Lec.*
TYCHUS, *Leach.*
longipalpus, *Lec.*
BRYAXIS, *Leach.*
conjuncta, *Lec.*
dentata, *Say.*
abdominalis, *Aube.*

BRYAXIS, *Leach. (continued.)*
puncticollis, *Lec.*
rubicunda, *Aube.*
DECARTHRON, *Brend.*
formiceti, *Lec.*
BATRISUS, *Aube.*
globosus, *Lec.*
nigricans, *Lec.*
RHEXIUS, *Lec.*
insculptus, *Lec.*

(To be Continued.)

ON SOME OF OUR COMMON INSECTS.

8. *THE BACON BEETLE—Dermestes lardarius, Linn.*

BY W. SAUNDERS, LONDON, ONTARIO.

This interesting little beetle, of which we give an enlarged drawing, as well as a representation of its larva, in fig. 18, is a very destructive creature, dreaded by every Entomologist who has had any experience of its ravages. Its larva is very destructive also in some carelessly kept provision and household stores, affecting hams, bacon, old cheese and other substances. It is a European insect, which has long been naturalized in this country, where it seems to be quite as much at home as in its native land. If this beetle can find its way into the drawers or boxes where the Entomologist has his specimens stored, it deposits its eggs on the bodies of the dried insects, where, as soon as the young larvæ are hatched, they begin at once to work their way towards the interior, and here they live and gradually fatten on the dried up viscera of the dead moth or butterfly, skilfully hiding themselves within the body they are consuming, and leaving, when their work is completed, only the bare shell which frequently falls to pieces when disturbed. Where the beetle cannot get at the bodies of the insects to deposit its eggs upon, it will often lay them by the side of small openings or crevices in such boxes, through which the young larvæ enter and at once begin their work of destruction. Besides the substances already mentioned, these larvæ feed on feathers, skins, cat-gut, hair and have even been reared on bees-wax, so that their appetite is by no means a dainty one, and their digestive powers may be considered good.

Fig. 18.

The larva is an ugly, brown, hairy creature, its body tapering from head to tail, and furnished with a pair of short, curved, horny spines on the top of the last joint; it is quite active in its movements, crawling about with a wriggling motion. The beetle is about three-tenths of an

inch long, of an oblong oval form, black, with a wide band across the wings at their base, of a dull, pale buff colour, dotted with black. Its legs are short, and it is rather timid and slow in its movements, feigning death for a time when disturbed.

Collections of insects and birds need to have a constant watch kept on them to keep out these intruders. Camphor, which seems to be offensive to these beetles, is frequently used to deter them from entering; but where they have entered and begun their devastating work, they cannot be disposesssed by such mild measures; in such instances purified benzine applied freely to the saturation of the bodies of the insects occupied will destroy the *dermestes* larvæ without injuring the collector's specimens.

NOTES ON APHIDES.

BY FRANCIS WALKER, LONDON, ENGLAND.

The following notes were suggested by "Observations," &c., on Aphides in THE CANADIAN ENTOMOLOGIST for July, 1873. The species noticed on *Rumex crispus* seems to have very much resemblance to *A. rumicis* in Europe; some other species of N. America do not differ from those of Europe, but have been probably introduced by means of shipping. With regard to European Aphides it is well known that the winged female of many species appears in the spring, that the wingless female is more fertile than the winged one, that the winged state is, partly at least, by means of the diminution of quantity or alteration of quality in the food, and that the winged state enables the species to have a change of habitation and thus to continue its race till the autumn. It is also well known that the male and the oviparous female do not appear till the autumn, and W. Curtis in the last century remarked that this appearance was owing to the change in the atmosphere and to the consequent difference in the food. The male is, in a few instances, wingless, but is very generally winged, and the oviparous female wingless, but in some few species the oviparous female is always winged.

From the great resemblance between N. European and N. American insects, especially in the more northern parts of each continent, it seems likely that the difference of the manner of life which is suggested by the "Observations" does not really occur. However, there would be much interest in the comparison between European and N. American Aphides, and in observing how far they are mutually counterparts, and in the investigation of N. American species from Canada southward, and in discovering the gradual change in their number and habits.

In Europe there is yet much to learn in their range between Lapland and S. Italy, the latter being the southern limit of the region in which they are known. The history of Aphides in Africa, Asia and Australia is yet almost unknown, though one species has been noticed in Madagascar, another in Hindostan, a third in China, one or two in the Eastern Isles and one in Australia. The parasitic Aphidii have been stated to be plentiful in N. America like as they are in Europe, and thus they afford a subject of enquiry as to the mutual resemblance in the species of the two continents, and the same may be said of the other parasites of the Aphides and those of the Aphidii.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 152.

ERRATA.

Ante p. 44, line 2nd from the bottom, for 'nipped' read *ripped.*

" 46, for '*amogattella*' read *auroguttella.*

" 47, for '*juglandisnigracella*' read *juglandisnigraeella.*

" 48, and wherever else the name occurs in these papers, for '*L. tritenoeanella*' and other misprints of the same name, read *L. tritaeniaella.*

XYLESTHIA.

X. Clemensella. N. sp.

Head and palpi snow white or hoary, the outer and under surfaces of the palpi yellowish dusted freely with fuscous; antennae yellowish. Primaries yellowish, reddish yellow and stramineous, with some white scales, and densely dusted with dark brown and bluish black scales, the dusting being much more dense in the middle and costal portions of the wing than in the dorsal and apical portions. There is a white costal streak just before the cilia and another very faintly indicated before the middle; dorsal cilae whitish at their beginning; ciliae brown. Thorax white dusted with dark brown; abdomen dark brown; legs and under surface whitish, rather densely dusted with brown, the legs with white annulations, and the anterior tarsi darker than the others.

There is a tuft of raised scales on the fold at the base of the primaries and three other large ones between the fold and the dorsal margin, two small ones about the end of the cell, three or four small ones on the disc and three or four others in the apical part of the wing.

As this species approaches *X. pruniramiella* Clem., the only other described species of the genus, I have hesitated to describe it as a distinct species, but it differs so decidedly from Dr. Clemens' description of *pruniramiella* that I conclude it must be a distinct species.

ARGIOPE.

A. dorsimaculella. Ante p. 13.

This species, for which I erected this genus, belongs to the *Glyphipterygidæ* near *Glyphipteryx*, and may be found to belong to *Acrolepia* Curt.

ADRASTEIA.

A. quercifoliella. Ante p. 72, and v. 4, p. 206.

The identity of this species with *Psoricoptera gibbosella* St., suggested at p. 72 *ante*, was based upon Mr. Riley's identification of the two, and upon a bad translation of a generic diagnosis from the German. Since the remarks at p. 72 were written, I have seen Mr. Stainton's generic and specific diagnosis in *Ins. Brit., v. 3* (to which I had no access until this summer), and find that the most distinctive character there given and

figured is the tuft of scales on the inner surface of the terminal joint of the labial palpi—a character which I have never found in any of the species which I have placed in *Adrasteia*. I am therefore not satisfied that the two genera are exact equivalents.

GELECHIA.

G. scutellariaecella. N. sp.

This species approaches closely those which I have placed in *Adrasteia*. There is a distinct divided bunch on the second joint of the palpi, but it is smaller than in the species which I have placed in that genus, and there are no tufts of raised scales. It differs from the true *Gelechia* in having the last joint of the palpi but little more than half as long as the second joint, and the antennae but little more than half as long as the wings.

Blackish brown, tinged with blue, dusted with pale or bluish white, with an indistinct whitish costal streak before the cilia, and an opposite dorsal one. The white dusting of the primaries is more dense and more hoary towards the apex of the primaries. Inner surface of the palpi yellowish. *Al. ex.* 3/8 inch. Posterior tibiæ clothed with a tuft of long hairs.

This is a very plain and inconspicuous insect, principally remarkable for the habits of the larva. It is white, with green contents, and head pale straw color, and mines the leaves of the "Scullcap" (*Scutellaria lateriflora*). It constructs a case or tube of silk lined externally with its frass. The tube is nearly flat, but curved, one side being convex and the other concave, and it is wider at one end than at the other and attached by its narrower end to the under surface of the leaves, and from it the larva passes into the leaf to feed, retiring into the case when alarmed and to pupate. It constructs but one case, and I think the attachment of that one to the leaf is permanent, and that the larva makes but the one mine.

I have never found it except in a single locality—near the village of Verona, in Boone County, Kentucky. There it is very abundant in September and October.

G. solaniiella.

G. similiella, v. 4, p. 193.

Similiella is a bad name for anything, and as I have discovered the larva of this species, I change the name accordingly.

The larva is at first whitish, but before maturity becomes deep greenish blue. It mines the under surface of the thorny leaves of *Solanum Carolinense*, eating the parenchyma entirely out of the mined portion, which looks like a dead, dry blotch, and the leaf usually curls over the mine. The larva constructs a sort of tube in the mine by sewing the upper and lower cuticle together, and it usually resides in this tube. In confinement it leaves the mine to pupate in a cocoon on the ground, and most probably does so in a state of nature.

G.? unistrigella. N. sp.

White. Primaries very sparsely dusted with pale fuscous in the apical portion; a fuscous spot about the middle of the costa, with two other small ones between it and the dorsal margin; a fuscous streak begins at the base of the costal margin and extends along that margin for a short distance, passing thence obliquely backwards across the wing, but not quite reaching the dorsal margin. Antennae pale fuscous, with narrow white annulations; palpi white, suffused with fuscous on the outer surface of the second joint, and with a fuscous ring near the base of the third joint. *Al. ex.* ½ inch. Kentucky.

Wings in repose almost horizontal, as in *Depressaria? (Gelechia) cercerisella*, which it also resembles in the palpi, which in both are those of *Gelechia.*

CORRESPONDENCE.

DEAR SIR,—

I have to thank you for your remarks on Mr. Andrews' note, printed on page 135. They render any reply of mine to Mr. Andrews almost entirely unnecessary. I have merely to add to your statements that I was entirely ignorant that the specimens of Heman's *marginalis* belonged to Mr. Andrews, nor knew that Mr. Andrews was at all concerned in the

matter till I read the note in the CANADIAN ENTOMOLOGIST. I received from Mr. Strecker his material belonging to Heman's *Hæmorrhagia* and *Alypia* for determination, and all the indication on the specimens of Heman's *marginalis* was the number 3, which referred to the locality "Michegan" in Mr. Strecker's letter to me accompanying the specimens.

AUG. R. GROTE.

September 11th, 1873.

DEAR SIR,—

I scarcely think that I intended my letter (in reference to Mr. Grote) to be published. However, as it has afforded you an opportunity to apply the lash where it was deserved (albeit it was somewhat over my shoulders) I do not regret its publication. In justice, however, to myself, I must request you now to give a place to this my response.

You totally misconceived the object of my complaint if you imagined that I sought "*sympathy.*" The wrong was impertinent, but not cruel. Personally, I could have passed over Mr. Grote's conduct without shedding a tear. But this gentleman has made himself, so far as Entomology is concerned, public property, and when a man in such a position perpetrates a wrong which, if repeated, may lead to injurious consequences, I think it the duty of any one cognizant of that wrong to expose it.

You seem to justify Mr. Grote, who, however, as my letter showed, was not required to make any of the investigations you allude to.

Here is a parallel case: *A* is a "money expert," knows good money from bad. B has a doubtful five dollar bill which he sends to *A* for his opinion as to its genuineness. *A* looks, determines that it is good, and puts it in his pocket! After a while B writes for the opinion, and, of course, for the bill. The answer comes this time, thus: "Oh, yes, your bill is good; so good indeed, that, imitating the great Ben Butler with his salary-grab, 'I have bought butcher's meat with it!'"

Now, you say that *A* is right; and, worse still, that you have no sympathy with B. Serves him right, I suppose.

W. V. ANDREWS, New York.

DEAR SIR,— September 18th, 1873.

It is my duty to say a word to your readers in reference to my accusations against Mr. Grote, and which appeared in your last issue.

Those accusations have occasioned a good deal of feeling betwixt Messrs. Grote and Strecker, if one may judge from the correspondence which has since passed between them, and which, by the courtesy of the respective gentlemen, I have been permitted to see.

Without betraying any confidence, I may say that the whole thing is resolved into a question of veracity as betwixt those two gentlemen, and I must say that while I feel confident that neither party would state a falsehood, there certainly is a great imperfection of memory somewhere—where, I, of course, cannot decide.

The statements made in my note, already referred to, were almost literally as told me by Mr. Strecker. Mr. Grote denies that he received any limiting instructions from Strecker. So the matter stands.

Let the thing drop altogether. It is not of sufficient importance to waste another sheet of paper about it. My object was not, Sir, as you imagined, to enlist a childish sympathy in my favor, it was meant to check a practice of which I had heard a good deal, and which, if continued, could not fail to exert an injurious influence on Entomological Science in America.

W. V. ANDREWS.

MR. STRECKER'S CORRECTIONS.

DEAR SIR,—

Mr. Strecker, of Reading, Penn., has been in correspondence with Mr. H. B. Moschler, who has written some very valuable articles on the Lepidopterous Fauna of Labrador, in the *Wiener Entomologische Monatschrift*, and whose description of *Gelechia labradorensis* I have translated in these pages. Mr. Strecker corrects the name *speciosissima* Mosch. to *speciosa* Mosch., in the citation of a species of *Arctia* in Mr. Robinson's and my List (1868).

This is right, and I committed an error in transcribing the name, and one that escaped me on the proofs, but was detected about fifteen minutes after the printed copies were in my hands. Mr. Strecker next, on

information from Mr. Moschler, unites *A. quenselii* Geyer and *A. gelida* Moschler, cited separate in our "List." This correction, coming from the author of the synonym, is doubtless of value, but we have no responsibility in the matter nor did we "fall into any error." If Mr. Strecker will refer to the two names in the List, he will find them followed by a dash (—), and from our preface he may gather the information that this dash indicates that we do not know the species and are not to be held accountable for their value. Next, Mr. Strecker (undoubtedly on the strength of Mr. Moschler's letters) says we fell into the same error with regard to *Arctia parthenos* Harris, and *Arctia borealis* Moschler. Mr. Strecker should have read my statement that the two were probably identical, published in the Proc. Ent. Soc. Phila., pp. 74 and 537 (1864). The species were, however, described as distinct by Professor Packard and the names are kept separate on this authority in the List; *borealis* being followed by a dash, since we do not know it as distinct from *parthenos*. At the time of describing *borealis*, Mr. Moschler did not know that Harris had described an allied species, nor in describing *speciosa*, that Kirby had described *virguncula*, since he does not allude to them; but perhaps, after all, the species described by Moschler from Labrador, may be distinct; at least it is yet an open question whether they are so or not. Where is *our* "error," then, with respect to these species of *Arctia*?

With only partial quotation of our remarks, Mr. Strecker unites our *luteola* from Quebec with *cordigera* from Lapland. We had only *mystilli* in nature for comparison, and judged of *cordigera* by description when we described *luteola*. That we judged the American to be a near ally of the European species is evident from our remark that it "*appears* to represent the European *cordigera* in our fauna." Now, that Mr. Strecker has received from Europe specimens of *cordigera* and compared them with *luteola*, and finds no difference, it becomes probable that they are the same species. This information is very interesting in a distributional point of view.

To conclude this notice I will draw attention to Mr. Strecker's repeated remarks that "great confusion exists with regard to the species of *Catocala*." These are not true of the most prominent collections of that genus. There is but little uncertainty about our species, and that with regard to the limits of a very few of them. I have determined during the last ten years nearly all material in this genus, sent to me from Canada, to Georgia, and all of Mr. Strecker's determinations have

come at first or second hand from me. The very poor descriptions in the Lepid. Het. have not as yet improved our knowledge of our species, except to the extent of giving us three very doubtful forms as new, the best of which *(C. obscura)* I thought might be Guenee's indicated var. of *insolabilis*, and so informed Mr. Strecker, who sent me a specimen for examination, accompanied by an epistolary threat that if I did not give him the name of it within a certain time, he would "describe it as new."

A. R. GROTE, Buffalo, N. Y.

MISCELLANEOUS.

AN AQUATIC BOMBYCID MOTH.—Mr. Bar, of Cayenne, has forwarded to the Entomological Society of France, descriptions and specimens of the various stages of an interesting Bombycid. The larva lives under stones in streams and rises to the surface for transformation. The cocoons are found in clusters floating on the water. Aquatic caterpillars have hitherto been known only in the lower families of Lepidoptera.—*American Naturalist.*

MODE OF EGG-LAYING OF AGRION.—Mr. G. W. Dunn writes us that while collecting at Santa Cruz, California, he observed a species of Agrion (as we find the insect to be) "flying about the water united, male and female. The female would light on a spear of grass growing in the water; the male would then let go, and the female go down the grass twelve or fifteen inches under water and deposit her eggs."—*American Naturalist.*

ADVERTISEMENTS.

EXCHANGE.—I am desirous to exchange English for Canadian or American Lepidoptera. J. C. WASSERMAN, Beverly Terrace, Cullercoats, North Shields, England.

COLEOPTERA FOR SALE.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by JOHN AKHURST, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

VOL. V. LONDON, ONT., OCTOBER, 1873. No. 10

EDITORIAL.

Our readers will observe, from the alteration in our title-page, that a change has been made in the occupant of the Editorial chair of this publication. At the annual general meeting of the Society, held at London on the 25th ult., the Rev. C. J. S. Bethune tendered his resignation of the office of General Editor, and Mr. Wm. Saunders was unanimously elected to take his place. This change of personality will make no difference in the character and management of this journal, except in the direction of improvement in material and greater regularity in issue. For some time past Mr. Bethune has desired to vacate the position of Editor—not from any diminution in interest in the publication, or from any cooling in zeal and attachment to the cause of Entomology—but solely because his position as Head Master of Trinity College School, entails upon him so much labour and engrosses so much of his time, that he cannot satisfactorily perform the duties that properly devolve upon the Editor of the CANADIAN ENTOMOLOGIST. Since the removal of the head quarters of the Society to London, the labour attending upon the issue of this publication has gradually fallen more and more upon Mr. Saunders, though largely shared in by Mr. Reed, the late energetic Secretary-Treasurer of the Society.

The retiring Editor—who will continue to aid in the maintenance of the journal, as far as his time will permit—begs to offer his most cordial thanks to all those kind friends who have rendered him so much assistance in the past, and to request that the same hearty support and co-operation may be afforded to his friend and successor.

ANNUAL ADDRESS

OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, 1873.

To the Members of the Entomological Society of Ontario:

GENTLEMEN,—Ten years have now gone by since a few of us met at the house of Professor Croft, in Toronto, and organized this Society. We commenced with less than five and twenty members, and now our Secretary informs us that we have over three hundred names upon our roll. A twelve-fold increase in a decade of years is certainly an evidence of progress upon which we may well congratulate ourselves, and which ought assuredly to stimulate all our members to use their utmost exertions for the maintenance and improvement of the Society. Those of us who from year to year have been entrusted by you with positions of office and duty in the Society, cannot but feel that it is for the best interests of our institution that more of its members should be led to take an active part in its work, and thus secure more efficiency in all our departments, and more certainty of a permanent developement of all our operations. Hitherto the work has fallen upon a few of us, and we have endeavoured to perform it as efficiently and heartily as we can; but we find that year after year our own professional and other duties make increased demands upon our time and attention, so that with all the desire in the world to devote ourselves to our favourite branch of Natural Science and the operations of the Entomological Society, we are unable to do so to the same extent as in earlier years. On this account—not from any diminution of zeal and interest on our own part—we are most anxious that more of you should take your share in the work and aid us in maintaining unimpaired the good reputation that the Society has already achieved. Each one, we are sure, can do something, and the united efforts of us all must assuredly be productive of satisfactory and permanent results.

Our sister Society—the Fruit Growers' Association of Ontario—we rejoice to see is rapidly growing in public appreciation and favour; its members' list of over 3000 names, its well-attended meetings in various parts of the country, its judicious distributions of fruit for experimental

purposes, and the vigour and zeal of its executive, are all matters upon which we may well congratulate its President, Directors and Members. That it may go on and prosper, and extend its work throughout our land, till every resident of the Dominion enjoys the fruit of his own vine and his own fruit-tree, is our most hearty aspiration.

During the past year but little has occurred in an Entomological point of view that calls for especial notice on this occasion. A year ago I ventured to call your attention to the subject of Specific and Generic Nomenclature, which has been so unpleasantly exciting the minds of Entomologists both here and almost everywhere else. My remarks, I was gratified to find, elicited a good deal of discussion in the pages of the CANADIAN ENTOMOLOGIST, and brought forth a very able paper upon the subject from the pen of Mr. W, H. Edwards, of West Virginia. The question, however, has by no means yet been set at rest and will no doubt continue to exercise us all for some time to come. At the Dubuque Meeting of the American Association for the Advancement of Science, a sub-section of Entomology was formed, and a committee of its adherents specially appointed to consider and report upon a series of rules upon nomenclature. Unhappily—owing to various circumstances—no report was drawn up, though, I must in justice state, that my friend Mr. C. V. Riley, of St. Louis, took a great deal of pains to elicit the views of the members and to draw up some conclusions from them. Last month, at the Portland meeting of the Association—which, to my very great disappointment, unavoidable engagements prevented me from attending—a new committee was appointed to re-consider the subject, and we trust that some definite rules will have been decided upon by its members before the meeting of next year at Hartford, Conn.

You will all, I have no doubt, be gratified to learn that, upon the suggestion of the sub-section of Entomology, the American Association unanimously passed a resolution inviting our Entomological Society of Ontario, as well as the American Entomological Society, to hold a general meeting of our members at Hartford next year during their annual session. I trust that this invitation will be cordially accepted and that a large number of us may there meet our American friends and enlarge and strengthen those cordial feelings of scientific brotherhood which have so long pleasantly existed between us. I may add, as a notable token of the estimation in which our branch of science is now held, that the Association will meet next year under the presidency of our ablest American Entomologist—Dr. J. L. Leconte, of Philadelphia.

You have already heard from our Secretary-Treasurer's Report the satisfactory condition of our finances and other business matters; I need not therefore trespass further upon your patience and attention. Heartily thanking you, gentlemen, for your kindness towards myself and my colleagues during our term of office, and for the honour which you have conferred upon me by calling me to preside over you,

I have the honour to remain, with best wishes for the advancement and prosperity of the Society,

Your humble and obedient servant,

CHARLES J. S. BETHUNE,

President Entomological Society of Ontario.

Trinity College School, Port Hope, Sept., 1873.

ON THE IDENTITY OF GRAPTA DRYAS WITH COMMA.

BY W. H. EDWARDS, COALBURGH, W. VA.

On the 30th of July Mr. T. L. Mead, at Coalburgh, took two females of *Grapta Dryas* and tied them in a muslin bag to a branch of Hop-vine. The result was a large number of eggs, laid on the leaves and in the bag. On the 5th the eggs were all hatched. The larvæ we carried through safely, and on the 21st the first ones began to change to chrysalids. In course of the next three days all were changed, upwards of sixty. Towards maturity some of the larvæ were white, as represented in the plate of *Dryas*, in the "Butterflies of North America." The others were black, like the larvæ represented in plate of *Comma* in the same volume. On the 30th the imagines began to appear, and nearly all are true *Comma;* but six are *Dryas*, two ♂ and four ♀. The relation of the two forms to each other is therefore similar to that of the two forms of *Interrogationis*. The name of the species should be *G. comma*, Harris, and the one form the type figured in my plate as *comma*, should be called *comma var. Harisii*, and the other *comma var. dryas*, the two being equal varieties of one species and not one a variety of the other.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 176.

EVIPPE, *gen. nov.*

Primaries—The costa attains the margin before the middle: the subcostal, which is faint towards the base, sends a branch to the margin from before the middle, two others near the end of the cell, another beyond the cell and becomes furcate before the tip, one of the branches going to each margin. Cell closed by a very short oblique discal vein without branches. The median sends two branches to the margin before the end of the cell, and becomes furcate behind it. Submedian furcate at base, Wing lanceolate, with moderately long ciliae.

Secondaries—Narrower than primaries, short, tip produced and margin deeply incised beneath it; costal margin slightly excised from before the middle to the tip. Costal rather short, attaining the margin at the excision. Subcostal simple, rather faint towards the base, attaining the margin just before the tip. Cell unclosed. No discal nervure, but an independent branch which arises near the median and going to the hind margin. Median three branched, the first arising near its middle (and rather minute) from the second. Submedian and internal short and indistinct.

Head smooth with appressed scales. Tongue moderately long, scaled at the base. Maxillary palpi microscopic. Labial palpi overreaching the vertex, second and third joints of about equal length, the second being slightly thickened with scales beneath. Antennæ simple, about half as long as the wings.

In repose the antennae are carried upon the wings, which are deflexed, the head is applied to the surface, and the posterior end of the abdomen and wings are elevated. It runs very rapidly, and is easily disturbed. The structure, especially that of the antennae and wings, allies it to *Trypanisma* Clem., but there is something in its appearance which reminds one of a

Gracillaria, and the pattern and shades of coloration approach those of *G. salicifoliella*. It is, however, nearer to *Agnippe*, *ante v. 4, p. 194*, than to *Trypanisma*. The neuration of *Agnippe* is incorrectly given at *v. 4, p. 194*. That of the primaries is identical with that of this species, except that it lacks the first subcostal branch of this species; and that of the secondaries is identical with this species. I do not feel certain that I am right in separating them generically. *Gelechia? difficilisella, ante v. 4, p. 192*, belongs to the same group, near to if not in *Trypanisma*.

E. prunifoliella. N. sp.

Labial palpi silvery white, except the base, which is dusky, and the tip, which is dark gray brown. Head silvery white. Antennae dark grayish brown. Thorax dark grayish brown on each side above the wings with a broad median longitudinal white streak from the base to the apex and continued thence along the posterior margin of the primaries to the cilia. Primaries (except the posterior margin as just stated) dark grayish brown, the line between the two colors scalloped, or rather the white portion sends two or three teeth or processes into the brownish part, one of which is just before the ciliae and is opposite to a costal white streak; dorsal ciliae dusky silvery dusted with dark brown. Secondaries pale yellowish fuscous.

When the insect is in repose it appears to be dark gray brown, with a wide white streak from the mouth over the head, thorax and wings to the dorsal ciliae. *Al. ex.* 3/8 inch. Kentucky.

I do not know whether the larva is at any time a miner or not. It feeds upon the leaves of the Red Wild Plum (*Prunus Americana*), where I have found it in September feeding under the tip of the leaf turned downwards. The larva is pale green, immaculate. I have frequently found on the under side of the same leaves a tentiform mine which I suspected to be that of *Lithocolletis cratægella* Clem., but I have never succeeded in rearing the insect from it, and *possibly* it may be made by this species in its younger stages.

EIDOTHOA, *gen. nov.*

The insect upon which I found this genus resembles *Evippe prunifoliella* so closely that I have hesitated much as to the propriety of separating them generically. The differences most marked are in the

neuration. The discal cell of the primaries is wider in this species and the discal vein is of course longer, and the median, instead of being three branched with the third branch furcate behind the cell, divides into three approximate simple branches about the end of the cell. In *Evippe* the median vein of the hind wings is three branched, in this species it is two branched.

The antennae in this species are also a little longer than in *E. prunifoliella.*

In other respects it does not seem necessary to separate the species.

This species was found in my study, where it had probably escaped from some of my breeding cages.

E. vagatioella. N. sp.

Palpi with alternate annulations of white and dark grayish brown, five of each color, the tip being white and the base gray brown; face white. Vertex yellowish dusted with grayish brown; antennae fuscous; thorax dark brown and white, about equally intermixed; primaries dark brown faintly dusted with white, the dorsal margin being white, dusted with dark brown, especially towards the apex, where it might more properly be called brown streaked with white. There is an irregular indistinct whitish streak on the costa near the base, and a white spot on the extreme costa behind the middle; the white color prevails in the apical portion of the costal margin, but is dusted with brown, and the apex is white with a rather large dark brown apical spot or patch. Cilia pale grayish dusted with white. Legs and under surface whitish, with patches of grayish brown. *Al. ex.* ½ inch. Kentucky.

HELICE, *gen. noo.*

This genus and the species on which I have founded it approaches *Trypanisma* Clemens, *Gelechia difficilisella,* and more remotely *Agnippe* and *Evippe.*

Wings horizontal in repose. Primaries lanceolate; the costal attains the margin before the middle; the subcostal sends to the costal margin two branches before the end of the cell, one from the end, another behind it and becomes furcate before the tip, delivering a branch to each margin.

Cell narrow, closed by a short, oblique, and faint discal vein. The median sends a branch to the dorsal margin before the end of the cell, and becomes furcate behind it. Submedian furcate at base.

Secondaries narrower than the primaries, apex long and sharply pointed, with the posterior margin suddenly and deeply incised beneath it and the anal angle rounded; costa emarginate from the middle to the apex. The costal vein attains the margin about the middle. Subcostal straight, attaining the margin just before the tip. Median dividing into three branches. Cell unclosed. (In *Trypanisma* Dr. Clemens says the cell is closed by a faint discal nervure, but I have not been able to detect it in this genus, nor in *Evippe*, *Agnippe* or *G. difficilisella*, all of which are closely allied to *Trypanisma*.) *T. prudens*, Clem., I have never seen. *Evagora*, Clem., belongs to the same group.

Tongue scaled, longer than the anterior coxæ. Maxillary palpi small but distinct under the lens; labial palpi long, slender, over-arching the vertex, with the third joint almost acicular and longer than the two others united; the second joint is laterally slightly compressed and slightly thickened towards its apex. Antennæ simple, about two-thirds as long as the wings. Head and face smooth. Vertex short and face scarcely retreating.

H. pallidochrella. N. sp.

Head, thorax and primaries pale grayish ochreous, minutely dusted with fuscous. Primaries with a large transverse dark brown spot before the middle and a smaller one behind it, both appearing bronzy in some lights. Cilia reddish yellow; palpi dusted with pale fuscous; antennae annulate with dark brown. *Al. ex.* ⅓ inch. Kentucky in June.

ŒCOPHORA ? Zell.

I am not certain that the insect described below is properly included in this genus, though it approaches closely to it. It is also very near to *Callima* Clem., but I do not feel satisfied that *Callima* should itself be separated from *Œcophora*, and Dr. Clemens seems to have entertained the same doubt when he diagnosed the genus.

The following are the generic characters of this species :—

Primaries lanceolate; the costal vein attains the margin about the middle; just before the middle the subcostal sends a slightly sigmoid vein to the margin and from near the end of the cell two other shorter branches,

and proceeds to the *dorsal margin at the apex.* The discal cell is wide towards the end and the subcostal comes down obliquely towards the middle of the wing, from its second branch to its apical one. The cell is closed by a curved discal vein which gives off two branches to the dorsal margin. The median vein is nearly straight to the end of the cell, where it is deflexed to the dorsal margin, after having given off two branches from near the end. The median is furcate at the apex and attains the dorsal margin about the middle.

(This description is according to Dr. Clemens' system of nomenclature of the neuration. A more intelligible description, with the sketch of the wing before me, would be—median nearly straight to the end of the cell, which is widest near the end and is closed by the oblique curvature of the costal vein to its junction with the median. Nine branch veins are given off from the cell, the first from about the middle of the subcostal and three others from about the end of the cell, all going to the costal margin, the last one at the apex ; four other branches to the dorsal margin from about the end of the cell, and one from the median before the end of the cell.)

Posterior wings lanceolate, or rather wedge-shaped, the costa slightly excised from the apical third ; the costal vein attains the margin at the excision ; the subcostal distinct from the end of the cell to the apex, faint before the end of the cell ; the discal cell closed by a faint rather long oblique discal vein which gives off two branches to the dorsal margin, the superior branch being faintly continued through the cell to the base, the inferior branch is given off close to the median, which is three branched, the two last being approximate in their origin ; submedian distinct ; cell very wide.

Œ. boreasella. N. sp.

Palpi reddish brown ; antennae dark brown, annulate with white Primaries bright golden ; a reddish brown spot margined behind with white crosses the base and is continued along the *extreme* costa nearly to the apex. About the basal fourth is a large costal red brown spot white margined behind, and about the middle is a larger one margined with white before and behind ; opposite the space between these two spots is a larger dorsal red brown spot, white margined before and behind, its white margin being continuous with the white margin of the second costal spots. It is also connected with *each* of the costal spots by a narrow red

brown line. These spots are all large. A rather wide red brown line extends around the apex at the base of the ciliae, and is connected about the beginning of the *dorsal* ciliae with the second *costal* spot by a short somewhat oblique red brown line. The shape of the two costal spots and the dorsal one and the oblique line just mentioned is such as to include between the *three* spots on the costal margin a nearly oval transverse golden yellow patch, and to divide the apical portion of the wing into two nearly circular golden yellow patches, the largest of which is on the costa and has a small red brown spot near its centre, and this central spot is connected with the red brown of the apical margin by a line of mixed white and brown scales. Ciliae golden yellow. *Al. ex.* 3/8 inch.

Since the preceding description was written I have carefully examined fresh specimens of *C. argenticinctella* Clem., and I fail to discover wherein it differs from *Œcophora*. The neuration is exactly that of *Œ. pseudospretella* as figured by Mr. Stainton in *Ins. Brit. v. 3*. *Œ. boreasella* only differs in having the apical branch of the subcostal of the primaries simple instead of furcate.

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

(Continued from Page 170.)

STAPHYLINIDÆ.

FALAGRIA, *Mann.*
dissecta, *Er.*
venustula, *Er.*
bilobata, *Say.*
cingulata, *Lec.*
HOPLANDRIA, *Kraatz.*
pulchra, *Kraatz.*
HOMALOTA, *Mann.*
trimaculata, *Er.*
aemula, *Er.*
dichroa, *Grav.*
HOMALOTA, *Mann. (continued.)*
recondita, *Er.*
lividipennis, *Mann.*
opacula, *Fauvel.*
TACHYUSA, *Er.*
rigrilla, *Lec.*
ALEOCHARA, *Grav.*
fuscipes, *Fab.*
var, lata, *Grav.*
bimaculata, *Grav.*
opaca, *Fauvel.*

ALEOCHARA, *Grav. (continued.)*
picea, *Fauvel.*
binotata, *Fauvel.*
puberula, *Klug.*
GYROPHAENA, *Mann.*
vinula, *Er.*
dissimilis, *Er.*
socia, *Er.*
DINOPSIS, *Matth.*
americanus, *Kraatz.*
LEUCOPARYPHUS, *Kraatz.*
silphoides, *Kraatz.*
COPROPORUS, *Kraatz.*
ventriculus, *Kraatz.*
laevis, *Lec.*
scitulus.
TACHINUS, *Grav.*
nebulatus, *Fauvel.*
fimbriatus, *Grav.*
TACHYPORUS, *Grav.*
jocosus, *Say.*
maculipennis, *Lec.*
acaudus, *Say.*
brunneus, *Er.*
cribricollis.
CONOSOMA, *Kraatz.*
crassum, *Lec.*
basale, *Er.*
scriptus, *Fauvel.*
BOLETOBIUS, *Leach.*
niger, *Er.*
pygmaeus, *Mann.*
cinctus, *Er.*
cincticollis, *Er.*
dimidiatus, *Er.*
BRYOPORUS, *Kraatz.*
flavipes, *Lec.*
rufescens, *Lec.*
testaceus, *Lec.*
MYCETOPORUS, *Mann.*
americanus, *Er.*
ACYLOPHORUS, *Nordm.*
flavicollis, *Sach.*
pronus, *Er.*
QUEDIUS, *Steph.*
fulgidus, *Er.*
capucinus, *Er.*
molochinus, *Er.*
caenobita, *Fauvel.*
ferox? *Horn.* (specimen lost.
CREOPHILUS, *Steph.*
villosus, *Kirby.*
LEISTOTROPHUS, *Perty.*
cingulatus, *Kraatz.*
STAPHYLINUS, *Linn.*
maculosus, *Grav.*
cinnamopterus, *Grav.*
vulpinus, *Nordm.*
badipes, *Lec.*
mysticus, *Er.*
tomentosus, *Grav.*
cicatricosus, *Lec.*
OCYPUS, *Kirby.*
ater, *Er.*
BELONUCHUS, *Nordm.*
ephippiatus, *Er.*
PHILONTHUS, *Curtis.*
cyanipennis, *Er.*
aeneus, *Nordm.*
hepaticus, *Er.*
blandus, *Er.*
ventralis, *Nordm.*
promtus, *Er.*
debilis, *Er.*
palliatus, *Er.*
thoracicus, *Er.*
lomatus, *Er.*
micans, *Nordm.*

PHILONTHUS, *Curtis. (continued.)*
- fulvipes, *Nordm.*
- brunneus, *Er.*
- aterrimus, *Er.*
- confertus, *Lec.*
- apicalis, *Er.*
- sobrinus, *Er.*
- pæderoides, *Lec.* (pictus, *Fauvel.*)
- quadricollis, *Fauvel.*
- mylabrinus, *Nordm.*
- atomus, *Grav.*
- noviboraensis—*(Horn ?)*

XANTHOLINUS, *Serv.*
- obsidianus, *Mels.*
- cephalus, *Say.*
- emmesus, *Say.*
- pusillus, *Sachse.*

LEPTOLINUS, *Kraatz.*
- ruficollis, *Lec.*

DIOCHUS, *Er.*
- schaumii, *Kraatz.*

LATHROBIUM, *Grav.*
- concolor, *Lec.*
- punctulatum, *Lec.*
- puncticolle, *Kirby.*
- brevipenne, *Lec.*
- armatum, *Say.*
- tenue, *Lec.*
- collare, *Er.*
- longiusculun, *Er.*
- dimidiatum, *Say.*
- nigriceps, *Dej. Cat.*
- rubripenne, *Fauvel.*

CRYPTOBIUM, *Mann.*
- bicolor, *Er.*
- melanocephalum, *Er.*
- sellatum, *Lec.*

CRYPTOBIUM, *Mann. (continued.)*
- pallipes, *Nordm.*
- badium, *Er.*
- despectum, *Lec.*
- latebricola, *Nordm.*

STILICUS, *Latr.*
- angularis, *Er.*
- dentatus, *Er.*

LITHOCHARIS, *Er.*
- corticina, *Er.*
- confluens, *Er.*
- ochrea, *Grav.*

SUNIUS, *Steph.*
- prolixus, *Er.*
- linearis, *Er.*
- binotatus, *Er.*
- longiusculus, *Er.*
- monstrosus, *Lec.*

PAEDERUS, *Grav.*
- littorarius, *Grav.*

PINOPHILUS, *Grav.*
- picipes, *Er.*
- parcus, *Lec.*
- opacus, *Lec.*

PALAMINUS, *Er.*
- testaceus, *Er.*

STENUS.
- semicolon, *Lec.*
- punctatus, *Er.*
- colon, *Say.*
- stygicus, *Say.*
- colonus, *Er.*
- egenus, *Er.*
- annularis, *Er.*
- arculus, *Er.*
- chalceus, *Fauvel.*
- juno—

(To be Continued.)

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA

COMPILED BY THE REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 132.)

312. COCCINELLA QUINQUE-SIGNATA *Kirby*.—Plate vii, fig. 1. Length of body 3 lines. A single specimen taken in Lat. 65°.

Body oblong-hemispherical, very minutely and thickly punctured; underneath black and a little downy. Head black with an acute white spot in the forehead between the eyes; antennae obscurely rufous, dusky at the base and tip; prothorax black, anterior angles and intermediate streak white; elytra tawny yellow with an abbreviated band common to both at the base, an oblique discoidal abbreviated band and apical dot, black; four distant lateral triangular white spots mark the breast.

313. COCCINELLA QUINQUE-NOTATA *Kirby*.—Length of body 3⅓ lines. A single specimen taken in Lat. 54°. Taken also by Dr. Bigsby in Canada.

]231.] Very like the last, but shorter and more hemispherical. Two subtriangular transverse spots between the eyes, apex of the nose, dot at the sinus of the eyes, and anterior angles of the prothorax whitish-yellow; basal band of the elytra broadest at the suture, the two other black spots are of equal size and placed transversely, and each forms an abbreviated band, falling far short of the suture and the lateral margin, so as to be scarcely more than two transverse spots; scutellar angle of the elytra paler than the rest: the breast has no white spots. In other respects it is exactly like *C. 5-signata*.

314. COCCINELLA TRICUSPIS *Kirby*.—Length of body 2¼ lines. Several specimens taken in the Journey from New York to Cumberland-house.

Body black, punctured. Head with two irregular transverse yellow spots between the eyes; antennae pale rufous, black at the tip: prothorax with the anterior angles and a slender portion of the anterior margin

yellow, the black part forming a large three-lobed spot; the middle lobe being the longest and truncated, the lateral ones shorter and rounded; elytra tawny-rufous, paler and almost yellow at the base and sides, where there is a black band common to both elytra not reaching the lateral margin, which anteriorly has a double sinus so as to form three triangular lobes or points in the band; towards the apex of each elytrum is another irregular black band, which reaches neither the suture nor the margin.

315. COCCINELLA INCARNATA *Kirby*.—Plate vii, fig. 7. Length of body 2 lines. A single specimen taken in Lat. 65°.

[232.] Body black. Mouth and its organs and antennae reddish; prothorax flesh-coloured with two large subquadrangular black spots, separated by a narrow flesh-coloured stripe, which occupy almost all the disk: elytra flesh-coloured, taken together with eleven roundish rather large black spots, three of which are common to both elytra, viz. 3, 4, 3, 1, the common spot at the apex is transverse; legs black with the base of the thighs and tibiae, tarsi, sides of the abdomen, and anus testaceous.

This species seems to come near *C. borealis* of Thunberg, but it differs in colour and the number and disposition of the spots.

FAMILY PIMELIADÆ.

316. PIMELIA ALTERNATA *Kirby*.—Plate v, fig. 9. Length of body 6½ lines. A single specimen taken at Carlton-house, Lat. 53°, in April.

[233.] Body dull-black, oblong, naked. Head minutely punctured; antennae shorter than the prothorax; prothorax widest in the middle, subquadrangular with the sides rounded, minutely but not very thickly punctured, with some slight impressions in the disk: scutellum short, wide, rounded at the apex; elytra with six elevated granulated lines alternately more pronounced, besides the suture and marginal one separating the epipleura, which meet just above the apex; epipleura granulated: posterior legs much longer than the four anterior.

Mr. Say says of his *P. rotunda* that it was the first of that genus found on the New Continent; that above described furnishes therefore a valuable addition to the American insect Fauna. Africa appears to be the metropolis of the genus, though several species have been found in Russian Tartary.

[A species of *Eleodes*, synonymous with Say's *Eleodes (Blaps) tricostata.*

FAMILY TENEBRIONIDÆ.

317. UPIS CERAMBOIDES *Linn.*—Length of body 8–8½ lines. A pair taken in the month of April, in Lat. 65°. Taken also in Canada by Dr. Bigsby. [Abundant throughout Canada; taken by Agassiz's Expedition on Lake Superior.]

Body dull-black, narrow, naked, minutely punctured. Head nearly round depressed, porrected; eyes lateral, kidney-shaped; nose circumscribed by the segment of a circle; antennae a little shorter than the prothorax, joints obconical, four last lentile-shaped; prothorax a little wider than the head, oblong with rounded sides; scutellum rounded at the apex; elytra taken together wider than the prothorax, a little dilated beyond the middle, and then sloping to the apex, which is acute; very unequal with numerous irregular deep impressions and rugosities, variously separated by a number of elevated lines or obtuse ridges running confusedly in various directions; legs long; thighs incrassated; tibiae and tarsi slender.

[234.] 318. TENEBRIO MOLITOR *Linn.*—Length of body 7½ lines. Taken in Nova Scotia by Capt. Hall.

Body oblong-linear, minutely and numerously punctured, a little glossy, naked, above piceous, underneath rufo-piceous. Head uneven, nearly orbicular; anteriorly rufo-piceous; antennae and palpi rufo-piceous; prothorax transverse, sides rounded with a reflexed margin; posterior margin wavy, just above which, on each side, is a roundish impression; posterior angles acuminate: scutellum transverse, subacuminate: elytra scarcely wider than the prothorax, slightly furrowed, furrows punctured with the interstices transversely somewhat wrinkled, and most numerously and minutely punctured; shoulders short, compressed and incrassated; cubit curved.

[An introduced European species that has spread all over Canada and the Northern States, and has become a great pest to millers, flour dealers and house-keepers.]

TENEBRIO PENNSYLVANICUS *Knoch.*—Length of body 8–9 lines. Several specimens taken in Lat. 54°; it was also sent me by Dr. Harris.

[235.] Body long, rather widest towards the anus, black, minutely punctured, naked, not glossy. Head somewhat quadrangular, longer than in the preceding species, uneven; prothorax nearly square with a minute impression above the scutellum; posterior margin wavy; lateral very slender and a little rounded; scutellum subtriangular; elytra with nine rows, including the marginal one, of punctures, and an abbreviated one at the base next the suture; under a powerful lens the interstices are minutely but not thickly punctured: the shoulders are scarcely thicker than the thighs.

[Belongs to *Nyctobates* Guen.; very abundant throughout Canada.]

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The third annual general meeting of the Society was held at the rooms, London, Ontario, on Thursday afternoon, Sept. 25th, 1873. The President, the Rev. C. J. S. Bethune, M. A., in the chair.

The minutes of the previous meeting were read and confirmed.

The Secretary-Treasurer then read the financial statement, showing a balance of $171.27 on hand.

On motion this report was received and adopted.

The President then delivered his annual address, a copy of which will be found on another page.

Officers for the ensuing year were then elected, as follows:—

President, Rev. C. J. S. Bethune, M. A., Port Hope; Vice-President, Mr. E. B. Reed, London; Secretary-Treasurer, Mr. Joseph Williams, London. Council—Mr. Wm. Saunders, London; Mr. R. V. Rogers, Kingston; Rev. Canon Innes, London; Mr. Geo. W. Bowles, Montreal; Mr. J. M. Denton, London. Auditors—Mr. C. Chapman, London; Mr. J. H. Griffiths, London.

The Secretary read a letter from Mr. Caulfield, of Montreal, on behalf of the Entomologists resident there, requesting permission to form a Branch Society in that city. This was most cordially given, and the Secretary was instructed to convey to Mr. Caulfield the best wishes of the parent Society for the future success of the Montreal Branch.

The Rev. C. J. S. Bethune having declined to act as Editor any longer, Mr. Wm. Saunders was appointed in his stead.

The following Editing Committee were duly elected: Rev. C. J. S. Bethune, M. A., and Messrs. Reed and Williams.

In accordance with clause 2, section 2 of the Constitution, the two following gentlemen were elected Honorary Members: Mr. V. T. Chambers, Covington, Kentucky; Mr. P. R. Uhler, Baltimore, Maryland.

The following were elected Ordinary Members: Mr. John Wilkie, Guelph; Mr. William McAllan, Woodstock; Mr. Samuel Anderson, Wyoming,

A communication was read by the President in regard to the following resolutions, passed at the late meeting of the American Association for the Advancement of Science:—

"We, the undersigned Entomologists, assembled at the 22nd meeting "of the Amer. Assoc. for the Advancement of Science, held at Portland, "hereby respectfully petition the American Entomological Society of "Philadelphia, and the Entomological Society of Canada, to appoint "yearly meetings to be held at the same times and places with the annual "meetings of the American Association. The undersigned are moved to "this memorial from the considerations, that such prospective action of "the Societies would ensure the annual assemblage of a large number of "Entomologists resident over a wide extent of territory, and also prac-"tically enlarge the sphere and increase the usefulness of these Societies."

"Resolved—That the American Association for the Advancement of "Science hereby endorses the accompanying memorial, and invites the "Entomological Societies to call yearly meetings of their members in "accordance with the request therein contained."

After some discussion Mr. Saunders moved, seconded by Mr. E. B. Reed—"That the Entomological Society of Ontario has heard with much "pleasure the above resolutions of the American Association for the "Advancement of Science, and will gladly do everything in its power to "carry out the proposed arrangements and facilitate the annual meeting "of American Entomologists."

"That we hereby tender our hearty thanks to the American Association "for their cordial invitation, and that the Secretary be requested to "forward a copy of this resolution to the above Association."

EDITORIAL SUMMARY.

In the *American Naturalist* for September we find two very interesting papers on Entomological subjects. The first by Prof. C. V. Riley, on "Controlling Sex in Butterflies," in which he shows, we think pretty conclusively, by the results of a number of experiments which he has instituted, that the theory advanced by Mrs. M. Treat in the March number of the *Naturalist*, to the effect that the relative proportions in the sexes of butterflies can be controlled by the quantity of food given, is untenable. Mrs. Treat contended that by half starving a brood of larvæ you would obtain as a result either exclusively males or a very large proportion of such, while by liberal feeding the reverse would be the case, the gentler sex greatly preponderating. Prof. Riley thus sums up his results: "On the whole, if these experiments indicate anything, they indicate that where more males than females are obtained from stinted larvæ, it is attributable to the fact that the females, being largest and requiring most nourishment, succumb most readily under such treatment; rather than that the sexual characteristics are modified and determined by such treatment."

The second paper is the "Third Annual Report on the Injurious and Beneficial Insects of Massachusetts," by A. S. Packard, Jr.

The author states that at a low estimate there are probably upwards of 50,000 species of insects in the United States, the proportions in the different families being roughly estimated as follows :—Hymenoptera (bees, wasps, ichneumon flies, sawflies, &c.,) 10,000; Lepidoptera (butterflies and moths,) 5,000; Diptera (two-winged flies,) 10,000; Coleoptera (beetles,) 10,000; Hemiptera (bugs, &c.,) 10,000, with several thousand species of Orthoptera (grasshoppers, &c.,) and Neuroptera (dragon flies, caddis flies, &c.) A large number of these insects are as yet undescribed, so that in the mere determination, classification and arrangement of these vast hosts of animated creatures, an immense task has to be performed for which the present number of working Entomologists is entirely insufficient, there being, the author states, but about thirty in this country who publish anything relating to insects. Hence the more important work of studying the history and habits of the various species is necessarily very much interfered with.

With regard to insectivorous birds it is said that they seem to have certain fancies of their own as to what they will eat among insects. The canker-worm, which appears to be avoided by most birds, is eaten in large numbers by doves, and the martin will store up in its nest quarts of the common striped beetle of the potato, to the exclusion of other insects.

Some interesting details are given in reference to the history and mode of life of the May Bug, *Lachnosterna fusca*, and also the Goldsmith Beetle, *Cotalpa lanigera*, both destructive to the roots of the strawberry. The Bean Weevil, an insect which seems to be largely on the increase in New England, is noticed, and some suggestions given in regard to checking its further spread. The seventeen year Locust and other species of Locusts are also referred to, as well as several other less injurious as well as beneficial insects.

A Distinguished French Visitor.—At the September 9th meeting of the Philadelphia Academy of Natural Sciences, among the distinguished visitors present were Prof. C. V. Riley, of St. Louis, and Dr. J. E. Planchon, professor of botany at Montpellier in France, the latter of whom is now in this country under authority of the French Government, to investigate our grape diseases. By invitation of the President, Dr. Ruschenber, Prof. Riley gave an account of the *Phylloxera* or grape vine root-louse, with his most recent discoveries in regard to the same. He had little doubt but the insect was at the root of most diseases that attack the grape in this country, as it was certainly in Europe. Prof. Leidy inquired of Mr. Riley the true position of the insect in scientific classification; Prof. Riley replied that it was not yet well settled. Its appearance brought it somewhere near the aphids, but it did not have successive broods from one impregnation; aphids did. In this respect it approaches *Coccus*. He thought it between the two families.

Prof. Planchon described the ravages of the insect on the grape-roots in France, and thought them less destructive on the roots of American species of grapes than the European; and one of the objects of his mission was to ascertain this fact definitely, so that in Europe some American vines might be used as stocks for their vineyards.

It was clear from the fact, that the European vines had been but recently attacked by it, and had suffered so severely from it; while in America—the home of the insect—the wild vines had done tolerably well

for so many ages, that the *Vitis vinifera* with it was more of a favorite. He excused himself from any lengthy remarks on account of his limited English, and would briefly say that he agreed entirely with Prof. Riley's views regarding it.

Mr. Thomas Meehan gave a history of grape-culture and grape-diseases in Pennsylvania from the earliest time to the present, and showed that the failures had never been satisfactorily explained on any theory sometimes given, such as change of climate, or depletion of the soil. There were always some facts or figures which rendered every previous theory inadmissable to his mind, as he had frequently stated in other places. Prof. Riley's insect discovery, however, met all the requirements of the case, so as to give an air of possibility to Mr. Riley's views, such as no other theory has possessed. That when we saw the foreign grape and others which often did perfectly well for years in one locality, and then failed, it seemed absurd to suppose that the climate or soil suddenly gave out; but a sudden incursion of a brood of root-insects was a cause that could have such a sudden effect.—*Gardener's Monthly.*

LEAF-CUTTER BEE.—For five summers a rose-leaf-cutter bee has built her nest in a narrow-spouted watering-pot in my garden, and I have just heard of another nest, found in the touch-hole of a gun belonging to our volunteer artillery. My books on entomology only mention these bees' nests as found in earth or cavities of walls; therefore I venture to record the above as rather unusual localities.—*J. C. in Hardwicke's Science Gossip.*

ADVERTISEMENTS.

EXCHANGE.—I am desirous to exchange English for Canadian or American Lepidoptera. I should also be glad to exchange living pupæ of many British Lepidoptera for pupæ of American species. J. C. WASSERMAN, Beverly Terrace, Cullercoats, North Shields, England.

COLEOPTERA FOR SALE.—A number of Rocky Mountain Coleoptera will soon be for sale in sets by JOHN AKHURST, 19, Prospect Street, Brooklyn, N. Y.

The Canadian Entomologist.

VOL. V. LONDON, ONT., NOVEMBER, 1873. No. 11

ON SOME OF OUR COMMON INSECTS.

9. *THE DRAGON FLY—Libellula trimaculata, DeGeer.*

BY J. WILLIAMS, LONDON, ONTARIO.

This insect belongs to the order Neuroptera, which term signifies nerve-veined, so called in consideration of the netted structure of the wings. The members of the particular family *(Libellulidæ)* to which our specimen belongs, rival many of the Butterflies in their graceful shapes and brilliant colouring, while they excel them in rapidity of flight. These insects have received various popular names in different countries—the French call them Demoiselles, the Germans Florfliegen or Gauze-flies, or Wasserjungfern or Virgins of the Water, while the English style them Dragon-flies, Horse-stingers or Devil's Darning-needles. The English terms, although less poetical than those of our European friends, are, we believe, in a measure, more appropriate to the private character of these insects, who fully earn the title of Dragon-flies, although they are not Horse-stingers; of the third title we can say nothing.

Our specimen, *Libellula trimaculata* (fig. 19) when full grown, may

Fig. 19.

be described as follows:—The body is much elongated and cylindrical, and attains a length of two inches, in average specimens. The head is

large and bears two very large and prominent compound eyes. These eyes, which consist of many thousand facettes each, are so large that they meet on the upper surface of the head. This great power of vision is still increased by three simple eyes, or ocelli, situate on the upper surface of the head. From the front part of the head project two short, tapering antennae. The mouth occupies the front under surface of the head, and is a most formidable structure. The upper lip is broad, and conceals very powerful toothed organs, called mandibles; other organs of the mouth are also armed with strong teeth which enable the creature to satisfy its carnivorous desires. The most remarkable portion of the mouth, however, is the lower lip, a large, flat, lobed organ, closing the mouth from the under side, and which may be projected forward to a comparatively great distance when attacking other insects.

The thorax, or middle portion of the body, is three or four times as long as the head, and very much greater in diameter. It resembles the head in colour, being a medium chocolate shade, and is sparsely clothed with very short hairs of the same hue.

The abdomen, or posterior part of *L. trimaculata* tapers very gradually to the end, and is much smaller in diameter than the thorax, but more than twice its length. The colour is slightly paler, and is relieved by a line of pale yellowish blotches along each side, which gradually become smaller in size toward the end of the body. The upper surface is arched, while the under is flattened.

The legs are six in number, and are attached three to each side of the lower surface of the thorax.

The wings, which are four in number, are attached two to each side of the upper surface of the thorax, and are about one and a quarter inches long, and three eighths to nearly half an inch in breadth; the front ones being slightly the narrowest. The substance of the wings is a very delicate net-work covered by a thin transparent membrane having a shining surface. From the place of attachment of each wing there proceeds a narrow elongated patch of a deep brown colour, while from about the middle of the wings there is a large irregular patch of the same colour, which extends completely across. The structure of the wings combines great strength with lightness, thereby enabling the insect to fly with very great rapidity. Their shining surface, transparency, and brilliant colouring in this and other members of the same order, combine to give them a

beautiful appearance when flying in the bright sunshine, and evidently suggested the popular names given to them by the French and Germans.

The Dragon-fly is usually found in the vicinity of small streams or ponds, for reasons we will soon give. On bright and warm days in July and August it may be seen skimming over the surface of the water or ascending in graceful curves into the air, in search of food. When it rests, its wings are expanded horizontally.

Notwithstanding their graceful and "Demoiselle" appearance, they are most bloodthirsty creatures. Their rapid flight and enormous range of vision enable them to capture other insects with ease, while, their taste not being limited, they can consume butterflies, moths and other insects without compunction, and they are known to destroy and eat each other, as well as very small fishes (Figuier). However, it is this ravenous propensity which makes this insect so very valuable to man, as they destroy immense numbers of other insects which are injurious to vegetable and other products, and do not injure these substances themselves. A few of them shut in a house will soon rid it of flies, bugs and mosquitoes, and therefore their presence should be welcomed. The popular opinion that they are dangerous to man is without foundation, as they can neither bite, sting, or poison him.

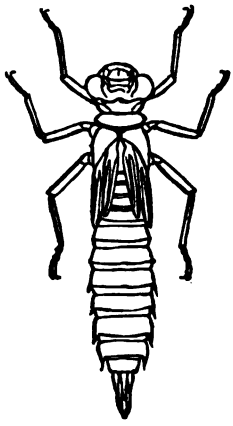
We may now consider the development of *L. trimaculata* from the egg, as it furnishes some very curious and interesting information.

When the female is about to deposit her eggs, she attaches herself to some plant growing out of the water, and pushing her abdomen beneath the surface, glues a bunch of eggs to the submerged stem or leaf (Uhler). These eggs produce larvæ which have a distant and ugly resemblance to the perfect insect. The larva is active and passes its existence in the water, feeding on numerous weaker insects. It possesses a curious syringe like apparatus situated in the end of the body, by which it discharges a stream of water for a distance of two or three inches behind it, thereby propelling the insect forward. The motion thus given is most irregular and appears to be beyond the control of the larva. This curious arrangement serves for respiration as well as locomotion.

The larva soon reaches the pupa state (corresponding to the chrysalis state of a butterfly), in which it is also active, crawling over the bottom of the stream preying on other insects. In this state it is longer than the

larva, and still more resembles the perfect insect. The accompanying figure (No. 20) of a pupa of a species of *Æschna*, nearly allied to *L. trimaculata*, will give an idea of the appearance of that of our Dragon-fly.

Fig. 20.



When about to become a perfect insect, the pupa climbs up some suitable plant near the surface of the water and attaching itself firmly awaits the last great change. In a short time the skin opens down the back, and the adult Dragon-fly, by bending backwards and forwards for some time, emerges. It only requires to remain a few hours till its wings attain their full size and hardness, when it starts off on a life long expedition of plunder.

REMARKS ON RECENT NAMES GIVEN TO SOME LEPIDOPTEROUS INSECTS.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

Looking over some recent papers, by one of our most careful and distinguished naturalists, well known by his contributions to all branches of Natural History, but more particularly to Lepidopterists by his *exhaustive* studies on the genera of North American Bombycidæ, we were surprised to see the numerous and apparently unnecessary repetitions of the same specific name in closely allied genera and families.

In a single article on the Phalaenidæ of California, there are in this group alone *ten* species named *Californiaria* or *Californiata*. If the Phalaenidæ were an immense group, containing many distinct generic types but loosely connected by intermediate forms, so large a number of species of the same name would be opposed to all precedent in nomenclature. But, on the contrary, there is no group so compact, none in which the genera are so difficult to define, and united by stronger and

more conspicuous characters. Such being the nature of this group, we would expect at least to find *Californiaria* distributed among the different families, but it occurs in the same family; and in two genera *Tephrosia* and *Boarmia*, so intimately related that only an expert Entomologist can separate them correctly in every instance.

This is not the only case in which this name is repeated by the same author, for in "Contributions towards a Monograph of the Bombycidæ of the United States," *Californica* occurs four times, in the genera *Pyrrarctia*, *Leucarctia*, *Phyganidia* and *Clisiocampa*, the first three of which are in the same family, and would have been referred to the same genus, *Arctia*, ten years ago. Here are fourteen species described by one author under one name, which should not properly have been used at all, for there already exist nine species of Lepidoptera described by previous Entomologists as *Californica*. In a paper on Geometridæ in the 5th Report of the Peabody Academy of Science, we find three species having the name of *Sulphuraria*, which has already been much used in Lepidoptera.

It seems to us that this repetition in species of the same group and country cannot fail to cause confusion, and to render our nomenclature, the condition of which is at present deplorable, still more difficult to straighten out.

There certainly is no warrant in the works of the writers on Lepidoptera for such a proceeding, and Guenee, the great authority for Noctuilites and Phalaenites, is scrupulously careful in this regard, and of the hundreds of species which he described, in not a single instance is the name repeated.

NOTES ON COSMIA ORINA, GUENEE.

BY AUG. R. GROTE., BUFFALO, N. Y.

Mr. Wm. Saunders has sent me, under the number 115, specimens of a Noctuid "from larvae found on oak, imago July 19th," which I regard as this species. The moth is variable in general colour and the appearance of the discal spots, and hence Guenée's description will not always literally apply. The only difference of importance I can see is that the two median trapezoidal lines on the fore wings are wider apart on the internal margin than in my specimens of the European *trapezina*. Guenée

mentions this character in his description of *C. orina* in the following words: "les deux lignes medianes fines, blanches, disposees en trapeze plus ouvert par le bas que chez *Trapezina.*" Except that the hind wings are paler, I hardly see any other difference and I do not see the discal point beneath. In one specimen the "points terminaux" are "bien marqués," as in the var. A of *trapezina*, but the wings are not "teintés de rouge—brique clair."

ERRATA ET ADDENDA TO MR. GROTE'S PAPERS.

P. 143, line 19, for Basilarclia read Basilarchia.

" " 31, add "Polygonum had been previously used in Botany."

P. 144, line 29, add "Hubner's *cereus* is a South American species. Westwood's *caenius* is our very distinct *pumila.* Hubner does not, in fact, refer to *pumila* at all. It is no part of his genus Polystichtis."

NOTES ON THE LARVA OF COSMIA ORINA, GUEN.

BY THE EDITOR.

A smooth, yellowish green larva, found feeding on oak, taken by bush beating, June 20th.

Length nine tenths of an inch, form cylindrical.

Head rather smooth, flattened in front, slightly bilobed, pale whitish green, with a few fine yellowish hairs not visible without a magnifyer.

Body above pale yellowish green, with a dorsal line of yellow, less distinct on the anterior segments, and covered with fine dots and short streaks of yellow, less numerous on second and terminal segments. There are a few fine short yellowish hairs scattered over the surface similar to those on the head. Spiracles small, oval, whitish, encircled with dull red.

Under surface of a slightly darker shade of green sprinkled with many minute yellowish white dots; feet pale and shining, prolegs green, both faintly tipped with brown.

One specimen which entered the chrysalis state on the 24th of June produced the imago on the 18th of July.

THE MILCH-COWS OF THE ANTS.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

The above title, which forms the subject-matter of the present article, is one that has claimed the attention of the most eminent naturalists of all time. Although much has been said and written upon the subject, still there is room for more. As science advances in its onward march new facts are developed ; some of these have a tendency to subvert long established principles, others to confirm pre-existent notions.

It is well known to naturalists and others that the Aphides secrete, or rather excrete a sweet, viscid fluid, which affords a rich repast for various species of ants. Ordinarily these little creatures are visited by the ants upon the tender branchlets and leaves of plants ; but it has been asserted that they even keep them as human beings do cows. By many this has been deemed partly imaginary.

Formerly I was disposed to drift with the popular opinion in this particular, but latterly some few facts, which accidentally fell under my notice whilst searching for Carabs, have confirmed me in the opinion that such is the case in at least one species of *Formica.*

Whilst exploring a neighboring thicket lately, I was led to raise every stone that lay across or on the side of my path, as experience had taught me that the objects of my search were generally to be found in such concealed places. It was on one of these occasions that I noticed a nest of *Formica sanguinea.* Disturbed by this unexpected intrusion, the colony soon presented a scene of activity. My interest being at once excited, I decided to change my occupation for the time, and instantly seated myself down upon a slight mound where I could command a view of the nest, and observe the minutest details of ant life. I was not long in perceiving that the community consisted of full-grown neuters, larvæ in various stages of developement, and a small species of white Aphis that is ordinarily found adherent to the roots of plants. Not a single male or female was to be seen, they doubtless were occupying at the time the subterranean galleries. The working portion of the community was evidently divided into three classes, each having a separate and distinct part to perform. The first class had the exclusive care

of the more matured larvæ; the second the comparatively feeble, and the third the charge of the herds. On the disturbance alluded to, each class immediately set to work in the discharge of its prescribed duty. But as it is to the third class that I shall particularly call attention, I shall be compelled to pass over the two preceding classes, referring your readers to the forthcoming Proceedings of the Philadelphia Academy of Natural Sciences, where their habits will be found minutely detailed.

But now to the third class. When the disturbance took place, its individual members were so intent upon soliciting by their caresses the much coveted sweet, most likely to be used as food for the young larvæ (but this I could not determine at the time), that they did not seem to notice the invasion of their jurisdiction. When fully aware of the fact instead of leaving their flocks at the mercy of the invader, and seeking their own personal safety by flight, each manifested the deepest concern for the little creatures who pandered so willingly to their temporal welfare. As if conscious of the debt of gratitude which they owed to them, they carried them down into their underground dwellings, where they found them comfortable quarters. Here it is plain that these tender creatures receive as much, if not infinitely more, care and attention than man is apt to bestow upon his flocks. Whether they bring the food to them or not it is not my province to say; but this I do affirm, that the galleries of *F. sanguinea*, whenever I have observed plant-lice therein, have always been constructed where these little creatures can find an ample supply of natural food. It may be probable that the lice are carried to the food; but that they are escorted to it by the ants is highly certain, as the slightest disposition to stray away by the more roving ones, is instantly checked. But on the whole, it cannot be denied that under the rule of their peaceful masters—the ants—they lead happy and prosperous lives.

NOTES ON COLLECTING.

BY W. V. ANDREWS, NEW YORK.

I can endorse (not necessary of course) Mr. Mead's "Notes on Collecting," pub. p. 78, vol. 5 of the "Entomologist," with right good will, having used similar methods myself for several years. I think I got my idea from D. Girard Knaggs.

A little improvement, however, may be made. If the collector, instead of putting in his "Cyanide of Potassium" in "lumps," will pound it to a fine powder, intimately mix it with the necessary amount of Plaster of Paris, and then pour in water till the mixture has by stirring assumed the consistency of cream, he will have a more efficacious, as well as a more lasting box (or bottle). When lumps, particularly large lumps, are used, it is difficult without using too much plaster, to cover the cyanide so that it shall not deliquesce. Of course if it begins to do so more and more of the surface is exposed and the box is always damp, and is liable to act on the colors of the captured insects.

Mr. Mead uses a bottle. I use a box. For general purposes the box commonly used for putting up Baking Powders will answer all purposes except in the "Catocala" season. But a box of that size, or as I think of any size, necessitates the making of a larger one on the same plan. That is a "transfer box," which remains in the house, or remains on the hunting ground, according to circumstances.

After making two or three captures from one tree, I never think of injuring the plumage of those by making an addition to them by introducing a lively moth; but immediately remove these to the "transfer box." By the next morning they are in good setting order. Thus I go through the night, the "transfer box" ultimately containing all the captures.

Of course it matters little whether a box or a bottle is used. In fact, it may be well to have a bottle for home service, and a box for the field. A box, as described, is a much better collecting vessel for Coleoptera than any alcohol bottle.

The best "transfer box" that I have ever used is a tin one about six inches in diameter and about two and a half inches in depth—used legitimately, I believe, for holding coffee samples.

Now, all these supposed improvements are based on the idea that having two or more dead moths in your collecting box, the third one, when introduced, will be absurdly lively for a time. This, at any rate, is my experience. The little fellows seem to have no idea of the important part they have to fill in Entomological Science, and dart about in the most reckless manner. Mr. Mead seems not to have met with such an inconvenience, but my captures have been uniformly obstreporous. Besides, I cannot help thinking that to *boulverse* a box of dead moths, say a hundred times a night, must do some little damage to them.

I never met with any inconvenience from ants as Mr. Mead has, but I have met with a rather serious one (because it is almost "morally" impossible to remove it) in the various species of tree-toads. Beautiful little fellows, with eyes like diamonds, that will mount your garden fences and snap up unwary Heterocera without compunction. Rather annoying but of course you cannot drive them away.

Mr. Mead says nothing about a light. I advise a *square* tin lantern with a good reflection and some means of shutting off the light, which should be turned on suddenly. A Bulls-eye concentrates the light too much. Strap the lantern around your waist. I like a little rum in the molasses for the moths, and a little for myself.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 196.)

FAMILY DIAPERIDÆ.

320. DIAPERIS *(Arrhenoplita)* BICORNIS.—*Oliv.*—Length of body, male 1½, female 2 lines. Several taken in the route from New York to Cumberland-house.

Body punctured, glossy; underneath black, above black-bronzed or green-bronzed. Head of the female transversely impressed between the eyes, unarmed; in the male just behind the eyes is a pair of long cylindrical vertical piceous horns rather paler at the apex, between which is a deep excavation; the nose also at the apex is armed with a pair of minute triangular teeth; mouth, in both sexes, rufous: antennae black with the three first joints attenuated and rufous; prothorax transverse with the sides rounded, posteriorly obtusangular but not lobed; scutellum

triangular; elytra slightly furrowed with the furrows punctured; interstices minutely punctured; anus underneath with two transverse obtuse ridges; legs rufous.

[Belongs to *Hoplocephala* Lap.; quite common in Canada.]

[236.] FAMILY BOLITOPHAGIDÆ.

321. BOLITOPHAGUS CORNUTUS *Fabr.*—Length of body 5 lines. Taken in Canada by Dr. Bigsby, in a Boletus of the birch, near Lake Huron. [Quite common in old dry fungi on trees and stumps. For description and figures see Say's Amer. Entomology, vol. i, p. 114, plate 51. With regard to the orthography of this word, we may mention that the Greek term is *Bolites*, and the Latin *Boletus;* as the termination *phagus* is Greek the generic name of the insect should be written as above, *Bolitophagus*, while *Boletus* is quite correct as applied to the fungus.]

322. BOLITOPHAGUS OBCORDATUS *Kirby.*—Length of body 6¼ lines. Taken in Nova Scotia by Capt. Hall.

Body linear-oblong, pollinose. Head brown-black, subtriangular; labrum ciliated with yellow hairs; antennae black-piceous, last joint smaller than the two antecedent ones, which are bigger than the rest: prothorax brown-black, obcordate with a larger anterior sinus for the head; surface flat, uneven behind from five obtuse ridges, the lateral ones abbreviated, and before from several rounded tubercles: scutellum minute: elytra embrowned with a yellowish tint from lutose scales, anteriorly [237] with three obtuse ridges: the interior one very short; the intermediate one discoidal, abbreviated at each end; and the exterior one reaching from the base to the apical tubercles, of which there are two much elevated, the interior one being the largest and highest; in the interstices there are four rows of deep impressions: the sides of the antepectus are verrucose; the abdomen is black-brown with lutose sides; the disk is longitudinally, densely, and thickly wrinkled, and the sides are verrucose; legs black-brown.

This species differs from the preceding one in the form of the thorax and the clava of the antennae, and ought perhaps to form a subgenus.

[Belongs to *Nosoderma* Esch.: rather rare in Canada.]

FAMILY HELOPIDÆ.

Genus MERACANTHA *Kirby*.—Labrum transverse, scarcely emarginate; labium subtriangular, longitudinally and obtusely ridged in the middle with a deep impression on each side; mandibles bidentate? at the apex; maxillæ mutilated; maxillary palpi first joint minute: second longer than the rest, clavate; third obconical; fourth very large, securiform; labial palpi broken off; mentum trapazoidal; antennae filiform, scape incrassated; pedicel obconical; third joint longer than the rest, subcylindrical, a little incrassated at the apex; fourth shorter than the fifth, subobconical; fifth longer than the subsequent ones, elongate, obconical; 6—10 obconical, gradually decreasing in length, and the 9th and 10th in thickness; 11th ovate acute.

Body ovate, convex, apterous. Head triangular; front elevated on each side at the eyes protecting the base of the antennae; eyes large, lateral, internally emarginate. Prothorax rather wider than long, narrowest anteriorly, subquadrangular; margined on the sides and anteriorly, margin very slender. Scutellum an obtusangled triangle. Elytra with the epipleura narrow, falciform; shoulders incrassated, armed with a tooth; calcaria very short and scarcely visible.

[238.] 323. MERACANTHA CANADENSIS *Kirby*.—Length of body 6 lines. Taken in Canada by Dr. Bigsby.

Body black-bronzed, naked, glossy, punctured: on the upper side of the body the colour is more metallic. Head and prothorax confluently punctured, two last joints of the antennae pale from hairs; elytra slightly furrowed, the sutural and the marginal furrows meeting at the apex and including the rest; furrows punctured; interstices very minutely and thinly punctured; sides of the abdomen longitudinally wrinkled: tooth of the shoulder short and wide, placed a little above the middle.

FAMILY STENOCHIADÆ.

Genus ARTHROMACRA *Kirby*.—Labrum transverse; labium dilated above the insertion of the palpi, subemarginate: mandibles bidentate at the apex; maxillæ bilobed; lobes thick, obtuse; maxillary palpi incurved, four-jointed; first joint minute; second longer than the rest, clavate; third shorter than the fourth, triangular; fourth very large securiform, with the truncature oblique: labial palpi three-jointed, last

joint securiform ; mentum obtriangular ; antennae filiform, eleven-jointed ; scape short, incrassated ; pedicel short, incrassated at the apex ; joints 3—8 obconical, nearly twice the length of the pedicel ; last joint cylindrical, downy, as long as the five antecedent ones taken together.

Body long and slender ; head triangular ; eyes kidney-shaped ; prothorax cylindrical, not wider than the head ; scutellum rounded ; elytra wider than the thorax, linear ; legs slender ; tarsi very long.

[239.] 324. ARTHROMACRA DONACIOIDES *Kirby*.—Length of body 5 lines. Taken in Canada, near Lake St. Clair, by Dr. Bigsby. Specimens also from Massachusetts.

Body black-bronzed with a greenish tint, glossy, with the whole upper surface thickly aud irregularly punctured ; underneath, except the sides of the trunk, impunctured. Antennae much longer than the head and prothorax, scape and pedicel dusky, 3—8 joints tawny-yellow : last joint black, downy ; prothorax nearly cylindrical ; elytra wider than the prothorax, obtuse at the apex ; thighs a little incrassated ; apex of the cubit and tarsi tawny-yellow ; two last joints of the latter dusky.

This singular insect, at first sight, looks very like a *Donacia*, a resemblance merely given by its colour.

[Belongs to *Statyra* Latr. ; previously described as *Lagria aenea* by Say (Am. Ent. i, 191) ; not uncommon in Canada.]

FAMILY CISTELIDÆ.

325. CISTELA ERYTHROPA *Kirby*.—Length of body 5 lines. Taken in Canada by Dr. Bigsby.

Body elliptical, gloss obscured, especially on the elytra, by very short decumbent hairs. Head longitudinally and slightly impressed between the eyes ; antennae longer than the prothorax, reddish brown, with the three first joints rufous : prothorax transverse, anteriorly not wider than the head, posteriorly obsoletely trilobed, and nearly as wide as the elytra ; lateral angles acute ; elytra slightly furrowed ; furrows scarcely punctured ; legs pale rufous ; posterior tarsi long, embrowned.

CORRESPONDENCE.

DEAR SIR,—

In the September number of the "Entomologist" I find my name mentioned as one of a committee appointed by the entomologists at the late meeting of the American Association, at Portland, to codify rules of nomenclature for the guidance of entomologists.

I was not present when this action was taken, and immediately notified the Secretary that I declined to act upon any such committee, which, in my judgment, should only be selected by and among zoologists in general.

SAMUEL H. SCUDDER.

DEAR SIR,—

I have to respond to Mr. Andrews' remarks, by requesting you to publish one of Mr. Strecker's letters to me regarding the species of *Hemaris*. This will show that I could not have known anything of Mr. Andrews. Mr. Strecker, it will be seen, asks my assistance. Possibly Mr. Strecker may have expected I would determine the species as "new," or publish my observations in his very defective work. I knew nothing of the fact that Mr. Andrews expected a dedication, or that I was to do the work of determination to enable Mr. Strecker to perform that graceful office. Mr. Strecker, for his private gratification, has instigated Mr. Andrews to figure in a most absurd manner before the public, and the whole exhibition is arranged for the purpose of bringing Mr. Strecker's indifferent publication into notoriety, at the expense of Mr. Andrews' desires to figure as an Entomological, or other, authority. From the letter following it will appear that Mr. Strecker could not determine the species sent me. For, when the specimens came to hand, "No. 1 Diffinis" was Hemaris tenuis: "No. 2, *like* Diffinis," *was* Hemaris diffinis; "No. 6" was H. uniformis, and, in consequence of my determination, it is so cited in page 12 of Mr. Strecker's work. "No. 4" was not received by me; "No. 3" was my Hemaris marginalis; "No. 5, Thysbe," was not the usual form of that species. None of the species named by Mr. Strecker were correctly determined. Considering that I had written at length on the genera

Hemaris (*Sesia*, Grote, restr.) and Haemorrhagia, and had described six out of the nine species previously catalogued, I was not struck with any impropriety on the part of Mr. Strecker in submitting his material for determination to me. Mr. Strecker's letter is as follows * :

Reading, March 13, 1873.

DEAR MR. GROTE,—

I am in a muddle with my Sesidæ. In your catalogue you have *thetis*, *diffinis*, axillaris, gracilis, buffaloensis, *thysbe*, fusicaudis, Floridensis ; those underscored I know, the others I don't know by a shot and a half. I have read your description of axillaris, and I think I have it, but ain't sure. Here is the way they are in my collection :

1. Diffinis.

2. Like Diffinis, but margin of fore wings slightly scolloped inside.

3. Like Diffinis, but margin acutely dentated inside and broader; from Michigan.

4. Thetis.

5. Thysbe.

6. Like Thysbe, but margin of wings not dentated inwardly ; abdomen more robust, not so long ; from Labrador. No. 6 may be Buffaloensis ; I thought I had Buffaloensis, but if this be it not, then I have not that species ; can't you get me an example of it and *gracilis* ?

What are fusicaudis and Floridensis ? Where can they be seen ? If I could borrow the examples not in my collection I would figure the whole lot of them, all the N. Am. Sesias on one plate, and with your aid in the accompanying text the world might be set to rights on that bothersome genus as far as the N. Am. species are concerned. Can you help me to get the material for my plate ? also, can you tell me what my Nos. 2 and 3 are by what I have written above.

Write soon to yours truly,

HERMAN STRECKER,

Box 111, Reading P. O., Berks C'y, Pa.

I wish, at least for the moment, to "let the whole thing drop together," as Mr. Andrews suggests, with the following note from Mr. Andrews, which is rather different in tone from those printed on pages

* This letter is set up from the original. In Mr. Grote's communication, pp. 176-177, for "Heman's" read everywhere "*Hemaris*."—ED. CAN. ENT.

177 and 178. It was occasioned by my sending him entire (by the hands of my friend) Strecker's letters to me, showing his entire concealment of Andrews' connection with the specimens, and absence of any restriction as to their use. While Mr. Andrews prints in one style, trying to justify an unprovoked attack, he writes in a different vein. I may be "public property," at least Mr. Andrews says I am, but I certainly am not the *private* property of either Mr. Andrews or Mr. Strecker, as which they would treat me. Mr. Andrews' simile of the five dollar bill enures to my credit, for Mr. Strecker sent me uncurrent ones and I returned good species that will pass current anywhere. Mr. Andrews would quarrel with a man who supplied him with the information by which his doubtful money became genuine. On further provocation I am prepared to furnish additional information relative to this absurdly disgusting plot in which Mr. Strecker is the most to blame, but in the exposure of which he has shrewdly placed Mr. Andrews in the position of suffering most. The "Press Copy" alluded to below was the letter on page 178.

Room 4, No. 117 Broadway, New York, Sept. 18, 1873.

DEAR SIR,—

Enclosed herewith please find Press Copy of a letter I have addressed to the "Canadian Entomologist." In justice to both parties I do not think I can say more or less.

In writing to Mr. Grote you will be kind enough to express my great regret that any occasion should have existed justifying my action in the premises, and my confident belief that he has not wilfully done wrong to me. Yours very truly,

W. V. ANDREWS.

E. L. Graef, Esq., 40 Court St., Brooklyn.

I apologize for taking up so much of your valuable room.

Yours truly,

AUG. R. GROTE.

Our limited space fordids any further continuance of this correpondence.—ED. C. E.

EDITORIAL SUMMARY.

How do Parasitic Insects Detect their Prey?—A variety of opinions have been expressed as to the means by which ichneumon flies and other parasitic insects discover the living objects upon which they seek to deposit their eggs. Some have inferred that this is done by sight, others by smell, or by the operation of some peculiar sense unknown to us. The rapid movements of some of the Hymenopterous parasites which attack caterpillars would rather lead one to suppose that the sense of touch is an agent, if not the sole agent. These flies may be noticed running rapidly up and down leaves and twigs, with vibrating antennae and palpi, sometimes going over very nearly the same ground again and again, which they would hardly do if they chiefly depended upon their eyes; and were any odour given forth which led them to their victims, these flies would hardly wander about in the manner we see. It is quite possible they may detect even the larvae of Tortrices by the feel of the leaf enclosing these, though the larvae themselves are screened.—*F. R. S. C. in Hardwicke's Science Gossip.*

Ants and "the Taint of the Hand."—In *Nature*, July 24, Mr. James D. Hague, writing on the habits of ants, attributes their dislike to the place across which a finger has been drawn to "the taint of the hand."

Now, Sir, I have frequently drawn a line with a piece of chalk across the track of ants, and observed in them the same symptoms of dislike as Mr. Hague's ants showed to the finger-mark.

I have also drawn a small circle with chalk round one or more ants, who will seek a spot untouched by the chalk through which to make their escape; but should there be no such opening, they will presently cross the circle. If, however, this enclosure be made upon a perpendicular wall, &c., they will frequently drop to the ground rather than walk across the line.

Now, as I have never observed this same dislike—exhibited by dropping—of the "taint" when ants have been running over my hands, and as the chalk-line has the same effect as the finger-mark, may it not be something else than the "taint of the hand" to which the ants object when their usual track is interfered with?—*G. E. E., Nature.*

We quote the following from the excellent "Entomological Record," by Prof. Townend Glover, in the monthly report of the Department of Agriculture, Washington, for October, at the same time thanking our esteemed friend for his kindness in sending us so regularly this valuable report:—

"GRAPE-VINE BORERS.—Mr. Fred. J. Kron, of Albemarle, North Carolina, in a letter to the Department, complains bitterly of the injury done to all varieties of grape-vines by the grape-vine borer, *Ægeria polistiformis*, described and figured in former reports of the Department (1854, p. 80, and 1867, p. 72.) Mr. Kron states the insect has destroyed for him one hundred and seven varieties of grapes, derived from the Luxembourg, in Paris, including some five thousand vines; and adds that there is but one variety that has, so far, defied its ravages, and that is the Scuppernong, which flourishes in the midst of the devastation caused by the borer, all around it. Mr. Kron likewise states that he found a Phylloxera on Clinton root, and adds: "The insect has been noticed here for more than thirty years," but he does not complain of its doing much injury."

"In connection with this last-named insect, so destructive to the grape-vines of France, Mr. Gaston Bazille, vice-president of the Agricultural Society of Herault, publishes a remedy for the Phylloxera, which is translated and republished by Mr. Charles V. Riley, in the New York *Tribune*, as follows:"

"Three holes are made around the injured or infested vine, varying the depth according to the nature of the soil, but generally 2½ feet. These holes were made in the experiments reported by means of a pointed iron bar and a heavy maul. A tube, with a funnel attached, is placed in the hole, two ounces of sulphuret of carbon are poured into the tube, which is then closed with a cork. The vapor of the sulphuret of carbon permeates the soil and impregnates all the roots of the vine. The gas engendered (though not the case with the liquid) is not fatal to the vine, but is sure death to the insects. Four ounces of the liquid has been found sufficient for an ordinary vine; but sprinkling on the surface must be carefully avoided, as it is in such a case very injurious to the vine, whereas a pound may be used in the soil without injury to the roots."

HOW TO SEND OBJECTS THROUGH THE POST.—I am often grieved, on reading your "notices to correspondents," to see the complaints of articles being received in such a "smashed" state as to be useless; and

in your number for this month it is recommended to enclose them in a tin box to withstand the energy of the post-office officials. But even that is not safe; for though the said box itself may not be broken by the tremendous whack the said officials usually lay on, yet still, very delicate objects inside may be injured by concussion. In short there is a better way, by which I have sent microscopic objects hundreds of miles and numerous times, without the slightest injury. It is as follows: It is quite a mistake to place stamps upon the box itself. They should be fixed to one of the common luggage labels, which is then attached to the box by a reliable piece of string, so as to separate it from the box by about two inches. The "official" may then whack away at the luggage label to his heart's content, and no harm be done. In this case the box need not be strong; and, to prove this I now send, for your acceptance, a very fine specimen of the *Chirodota violacea*, popularly known as "Pharaoh's chariot-wheels." The containing box, you see, is purposely slight; and yet, I will venture to say, you will receive the slide uninjured; and, if so, I hope you will inform your readers of the fact, and draw their attention to the impropriety of placing their stamps on the box. I will merely add that by the "common luggage label" I mean those made of paper pasted on cloth, and having a small ring at one end. They are sold by the dozen at almost every stationer's shop. I must add that I do not claim the merit of the invention. It is by no means new, but, nevertheless, does not appear to be known to many. One more remark. The address should be written (as you see I have) on the label itself; and, though not absolutely needful, it is a good plan to wrap the box in black paper, which prevents all temptation to stamp it, as in that case the stamp will not be seen.—*H. U. J.*

[Our correspondent is quite right. His frail box reached us safely, and we cannot but be glad of the post-office energy which has happened so fortunately for us!—*Ed. Science Gossip.*]

We heartily concur in the remarks of H. U. J. It is most grievous to have fine specimens so ruthlessly smashed, as we sometimes receive them, beyond any possibility of recognition. We are glad to state that this method of attaching a stout paper-and-cloth label, which we know in this country as a tag, and putting the address and stamps on it, instead of the box, has already been adopted by some of our correspondents. We received a few days since from a friend in San Francisco a box containing

several delicate moths, which, packed with this provision, reached us unhurt.

Having given at pp. 199, on the authority of the "Gardener's Monthly" for October, some remarks on Phylloxera said to have been made by Mr. C. V. Riley, we gladly make room for the following correction in the "Monthly" for November, just at hand:—

"PHYLLOXERA—CORRECTION.—Friend Meehan: In your October issue, speaking of some remarks of mine before the Academy of Natural Sciences, you have the following, the italics being mine:

Prof. Leidy inquired of Mr. Riley the true position of the insect in scientific classification; Prof. Riley replied that it was not yet well settled. *Its appearance brought it somewhere near the aphids, but it did not have successive broods from one impregnation;* aphids did. In this respect it approaches *coccus*. He thought it between the two families.

I am sure I said no such foolish thing. What I did say was that the insect belonged to the sub-order *Homoptera*, and that while it was at present classed with the plant-lice *(Aphididæ)* it bears close relation to the bark-lice *(Coccidæ.)* *Phylloxera* multiplies agamically like all the *Aphididæ*, and therefore does produce successive broods from one impregnation.

Yours truly,

C. V. RILEY."

BOOKS RECEIVED.

Die Larven von Ascalaphus, von Dr. H. Hagen, 8vo., pp. 64.

On the Larvæ of the Hemerobina, by Dr. H. A. Hagen, 8vo., pp. 6.

On the Butterflies of Anticosti, by Aug. R. Grote, 8vo., pp. 1.

Report on Pseudoneuroptera and Neuroptera of North America in the Collection of the late Th. W. Harris. By H. A. Hagen, 8vo., pp. 39.

Revision of the Genera and Species of the Tribe Hydrobiini, by George H. Horn, M. D. 8vo., pp. 20.

Revisionof the Several Genera of Meloidæ of the United States, by George H. Horn, M. D. 8vo., pp. 29.

Contributions to Entomological Bibliography, up to 1862, by Albert Muller, F. L. S. Nos. 1 and 2. 8vo., pp. 24.

Catalogue of the Pyralidæ of California, with Descriptions of new Californian Pterophoridæ, by A. S. Packard, jr. 8vo., pp. 15. (From Ann. Lyc. Nat. Hist., N. Y., vol. x, No. 9, 1873.)

Le Naturaliste Canadien, Sept., 1873.

Nature, to October 30th, 1873.

Monthly Reports of the Department of Agriculture, August, September and October.

Bulletin of the Buffalo Society of Natural Sciences, vol. i, No. 3. August, 1873.

Scottish Naturalist, April, July, October, 1873.

Newman's Entomologist, July, August and September, 1873.

Journal of Education, October, 1873.

The Zoologist, August and September, 1873.

Proceedings of the Academy of Natural Sciences, Philadelphia, January and February, 1873.

The Horticulturist, October, 1873.

Entomologist's Monthly Magazine, August, 1873.

American Naturalist, September, October, 1873.

The Canadian Entomologist.

VOL. V. LONDON, ONT., DECEMBER, 1873. No. 12

ON SOME OF OUR COMMON INSECTS.

10. *THE CLOUDED SULPHUR BUTTERFLY*—

Colias philodice, Godt.

BY THE EDITOR.

The clouded sulphur is everywhere one of our commonest butterflies, abundant in its season in fields and roadways, frequently congregating in groups on the borders of streams and springs, where, in hot weather they seem to enjoy settling on the moist ground. They are still more abundant in clover fields as the season advances.

Fig. 21.

Colours, yellow and black.

The female of this species differs somewhat in its markings from the male, as will be readily seen by reference to the figures, 21 representing the female, 22 the male. The ground colour of the wings in both sexes is bright yellow, marked on the outer edge with a dark brown or blackish border, narrower in the male than it is in the female, while in the latter it encloses on the anterior wings a broken row of irregular yellow spots. There is also a spot of black placed near the front edge of the fore wings, about half way between the base and tip, varying in form and distinctness. The hind wings in both sexes are less heavily margined, and near the middle is a dull pale orange spot. Both wings are dusky towards the base, and the fringes are pink.

Fig. 22.

Colours, yellow and black.

On the under surface the yellow colour is less bright, while the dark margins are either entirely wanting or else represented by a dusky shade margined occasionally within by a few dull brownish dots. The spot on the forewings is distinct, but paler and usually centered with a small silvery eye. That on the hind wings is much more distinct than above, being composed of a bright silvery spot in the centre defined by a dark brown line which is in turn encircled with dull orange. Immediately above and a little towards the outer edge is a much smaller spot of the same character; there is also a reddish dot on the anterior edge, about the middle of the wing. The antennæ are pink, with the knobs at their tips of a darker shade; the body is dark above, paler at the sides and underneath.

This insect appears first on the wing about the middle of May, becoming more plentiful towards the latter end of the month, but the time of its greatest abundance is later in the season, during the latter part of July and throughout August. In the second volume of the ENTOMOLOGIST, p. 8, Mr. Bethune remarks as follows: "On the 3rd of August, a lovely, bright, warm morning, after an excessively wet night, I drove about ten miles along country roads; every few yards there was a patch of mud, the effects of the heavy rain, and at every patch of mud there were from half a dozen to twenty specimens of *Colias philodice*, at least one I should think for every yard of distance I travelled. I must then have seen, at a very moderate computation, about ten thousand specimens of this butterfly."

The caterpillar of the Clouded Sulphur feeds on the cultivated pea, on clover, on the Blue Lupin, *Lupinus perennis*, and no doubt on many other plants belonging to the order *Leguminosæ*. The egg is about one twenty-third of an inch in length, tapering at each end, with twelve or fourteen raised longitudinal ribs, with smaller cross lines in the concave spaces between them. Their colour when first deposited is of a pale lemon yellow, which changes in three or four days to a pale red, then gradually to a bright red, and from that to dark brown just before the time of hatching. The duration of the egg stage is about seven days.

The young caterpillar just hatched is one-twelfth of an inch long and of a dull yellowish brown colour, but when a little older it changes to a dark green. When full grown it is about an inch long, with a dark green head and body, the latter with a yellowish white stripe on each side, close

to the under surface, with an irregular streak of bright red running through its lower portion. The body also has a downy look occasioned by its being thickly clothed with very minute pale hairs.

The chrysalis is about seven-tenths of an inch long, attached at its base, and girt across the middle with a silken thread. Its colour is pale green with a yellowish tinge, with a purplish red line on each side of the head, darker lines down the middle both in front and behind, and with a yellowish stripe along the sides of the hinder segments.

During the heat of summer the chrysalis state usually lasts about ten days. A day or so before the butterfly escapes the chrysalis becomes darker and semi-transparent, the markings on the wings showing plainly through the enclosing membrane.

NOTES ON THE EARLY STAGES OF SOME OF OUR BUTTERFLIES.

BY W. H. EDWARDS, COALBURGH, W. VA.

I herewith send you some memoranda of what I have done during the past summer, largely owing to the assistance of Mr. Mead. I consider it my most successful season in the way of obtaining larvæ and eggs. One of the most interesting species we discovered was *Lycaena pseudargiolus*. Mr. Mead noticed a female hovering about flowers of *Actinomeris squarrosa*, which is a weed found hereabouts in company with *A. helianthoides*—the last being a thousand-fold most numerous—and suspecting that she was ovipositing, he made a careful examination of the plant. He found several eggs laid directly on the flowers; then capturing two or three of the females, he tied them in a muslin bag over a bunch of these flowers (growing), the result of which was that many eggs were obtained. From those in the bag a few caterpillars were hatched and finally brought to maturity. They fed on the petals of the flowers. It became difficult to obtain food for them, as no plant of *A. squarrosa* could be found in the vicinity of my house, and we tried them on the other species (*helianthoides*), and this answered equally well. Last week the caterpillars that had escaped one accident or another, formed chrysalids in the same flower heads. In summer, as no species of *Actinomeris* is in bloom, the

butterfly must deposit its eggs on some other plant, so that it is evidently much less limited in its diet than many of our caterpillars.

The egg is a beautiful object, blue-green, flattened and depressed at the top, and covered with a net work like lace; raised on the surface.

The larvæ, when full grown, are a little over one fourth of an inch long and in shape a long oval, the head very small, black, and drawn—when at rest—within the next segment, which falls over the head like a hood. The body is green, dark dorsally, pale at the sides, and is marked dorsally by eight sagittate, tuberculated, yellow-green spots, one on each segment, pointing forwards, and truncated.

The chrysalis is dark brown, covered with minute hairs; of a long oval shape, compressed at the middle. Length $\frac{4}{10}$ inch.

We obtained eggs of *Thecla poeas* also, but only after trying many species of plants, as the food plant of this butterfly was entirely a matter of conjecture. But several eggs were laid on Blackberry. The larvae hatched, but did not eat, and soon died.

Eggs of *Phyciodes tharos* were obtained on grass, after trying the butterfly on every plant we could think of. The eggs were laid on the leaves and stems of a clump of grass placed under a glass jar. Many were laid directly on the sides of the jar. These eggs hatched, but the caterpillars refused to eat.

We had better success with *Phyciodes nycteis;* a female having been confined with a plant of *Actinomeris squarrosa*, she forthwith proceeded to deposit a large cluster of eggs, about 100, side by side and in regular rows, on the under side of a leaf. The larvæ hatched after a long interval, 13 or 14 days, and we at once from the cuticle of the leaf transferred them to a glass and supplied them with fresh leaves, and in due time the caterpillars reached the third moult. At this they stopped feeding, and are now in a state of hybernation. These caterpillars are dark brown, covered with pencils of short bristles of the same hue, that proceed from longitudinal rows of tubercles. When feeding they consume the whole surface of the leaf, which becomes very filthy from the excrementitious matter mixing with the juices of the leaf. But the caterpillars emerge from the mine as clean as a mole from under the ground.

I have also hybernating specimens of the larvæ of *Diana*, *cybele* and *aphrodite*, the eggs of which were obtained by Mr. Mead in the same manner. I consider this process of obtaining eggs, provided the food

plant is known, as infallible, and it is sufficient if the butterfly be enclosed in a bag on a limb of the plant, or if a low plant like the grasses, in a bag tied over a few stems or a single stem. I find it preferable to enclosing in a box or keg for the reason that with the latter it is impos sible to avoid the spiders, which destroy eggs and larvæ terribly.

I have succeeded with the Papilio's, all that are found here, as well as with the smaller species.

DESCRIPTION OF NEW DELTOIDS.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

Bomolocha scutellaris, Grote.

♀. Larger than *Baltimoralis* and differing at once by the parallel continuation of the transverse lines to the internal margin. The peculiar conformation of the dark median space, described by Guenée as resembling "une espéce de col" in *Baltimoralis*, is therefore wanting in *scutellaris*. Differing from *crassalis*, than which it is larger, by the inner transverse line being incepted on costa and joining internal margin without fusion with the outer transverse line. In coloration *scutellaris* is unusually bright and contrasted. The deep brown median field of the forewings shows the usual black dots. The inner transverse line is edged with white scales outwardly; it is strongly outwardly and obliquely acutely projected below median vein, running more shortly backwards, after the angulation, to internal margin. The basal field is paler brown, much washed with pale and whitish scales inferiorly. The outer transverse line is of the usual general shape, projected medially, even, very slightly notched. Beyond it the subterminal space is whitish, unusually contrasting, crossed by two faint rivulous lines, approximate to, and coincident with, the outer transverse line; the outer of these lines precedes a dusky irregular shade on costa. The subterminal line is white, more continuous than usual, enclosing the usual, but here less obvious and paler dots. The terminal space is pale, whitish above the two usual apical oblique blotches, where the costo-apical dots are marked in brown. Terminal punctiform line distinct, preceded by nervular white marks.

Fringes dark, cleanly cut with pale at the extremities of the veins. Hind wings uniformly dark fuscous, with a neat terminal line. Fringes pale, cut with dark scales; traces of a transverse line apparent on internal margin. Thorax and palpi dark; front and collar with an admixture of pale scales. Abdomen fuscous, the segments finely marked above by pale scales, the three basal segments with dorsal black minute tufts. Beneath pale ochrey fuscous; fore wings dusky within the faintly marked median transverse line, showing the discal dot; subterminal line indicated by costal dots; terminal line neatly indicated on both wings. Hind wings with discal dot and faint transverse median shade line.

Expanse 30 m. m. *Habitat* Albany (O. Meske); Quebec (F. X. Bélanger).

The six North American species of *Bomolocha* I arrange as follows. I recognize Zeller's *achatinalis* as my *madefactalis*. Guenée describes from a figure and I noted that his description did not quite correspond with my specimens, but I was unwilling to bestow a new name. It is questionable whether any of Guenée's descriptions from Abbott's figures should, with propriety, have been written. Mr. Lintner has sent me my dark var. of *Baltimoralis* as "♂ *laciniosa*,"

Bomolocha, Hubner.

Type: *Crambus crassalis*, Fabr.

scutellaris, Grote.

Baltimoralis.
- *Hypena Baltimoralis*, Guenée.
- *Hypena laciniosa*, Zeller.
- ♀ *Hypena benignalis*, Walker.

abalienalis.
- *Hypena abalienalis*, Walker.

bijugalis.
- *Hypena bijugalis*, Walker.
- *Hypena pallialis*, Zeller.

manalis.
- *Hypena manalis*, Walker.

madefactalis.
- *Hypena madefactalis*, Guenée.
- *Hypena achatinalis*, Zeller.

Hypena olivacea, Grote.

♂. Closely allied to *H. humuli* and *H. evanidalis*, and with the same pattern of ornamentation. The general color is dusky olivaceous, not dusky blackish brown, as in *humuli*, or light rusty brown, as in *evanidalis*, and without the median costal darker shade or apical streak, *evenly* colored. Four raised median black discal scale dots. Two (the reni-

form) approximate, superposed, situate at the extremity of the discal cell, set in a ground of pale scales, surrounded by the here acute outward projection of the transverse posterior line. Two others (the orbicular) further apart, obliquely placed, the lower and outer below the median vein. Both the transverse lines distinct, irregularly zigzag, continued, relieved against pale accompanying shades. Subterminal line apparent by the paler terminal, contrasting with the darker subterminal space, even, a little bent. Terminal dots: the dark fringes marked by paler shades opposite the dots; these paler shades extending on the terminal space before the dots as longitudinal streaks. Hind wings wide, pale fuscous, concolorous, without markings except a very faint relieving of the veins; fringes paler. Beneath obscurely shaded, with a discal dot on secondaries. Head and appendages dusky olivaceous; abdomen like secondaries.

Expanse 28 m. m. *Habitat* Albany (Lintner).

Apparently a smaller form than *H. humuli*, with narrower primaries, and of a peculiarly smooth concolorous dusky olivaceous tint.

SISYRHYPENA, n. g.

Ocelli; eyes naked, without lashes. Labial palpi with the second joint exceeding the front by half its length; third joint long, recurved, about one-third the length of the second joint, slender, more or less pointed, especially in ♀; the palpi are closely scaled. Antennæ (♂) strongly bipectinate; the pectinations are for the most part twice the length of the joints and they are furnished with long terminal spinules and thickly scattered setal hairs. At basal third there is a very slight tuft of scales on the inside, and here the pectinations are reduced in length to the base of the antennus, where they become obsolete, while they are lengthy on the outside. In the female the antennæ are simple. The legs are unarmed. The species is slight; the primaries are narrow, crambiform, drab-colored or brownish with a silky gloss, with inconspicuous and inelegant streaky and punctiform ornamentation.

A low Deltoid genus, perhaps nearest allied to *Tetanolita*.

Sisyrhypena pupillaris,* Grote.

* Spec. sub No. 10, ad cel. Zeller misi.

♂. Concolorous, silky drab, veins tending to be paler marked. Primaries with diffuse darker terminal shading, and a discal narrow outwardly extended streak. An exceedingly fine and faint outer transverse line, rounded opposite the discal cell. A subterminal oblique punctiform line from apices to internal margin within the angle. Costal margin dark shaded. The discal dots are perceivable against the longitudinal discal streak. Hind wings a little paler with a very faint transverse shade line. An interrupted fine dotted line before the silky fringes on both wings. Beneath darker; the hind wings much clouded with dark brownish, with a distinct discal spot and a continued transverse guttiform or cuneiform subterminal line, analagous to the subterminal line of the forewings above; faint traces of an inner transverse line. Forewings without markings except an incomplete reproduction of the subterminal shaded apices. Body parts concolorous; abdomen like hind, thorax like fore wings.

♀. The labial palpi are held as in the ♂, but the third article is more pointed. Slighter than the ♂, with simple antennæ and with almost wholly blackish brown primaries; the ♂ exhibits two transverse lines, while both female specimens have entirely glossy brown forewings without apparent marks except the inconspicuous discal points. Hind wings pale drab with faint darker terminal shading. Beneath the secondaries have the double lines more equally defined. Thorax and head dark, concolorous with primaries.

Expanse, ♂ 21 to 23 m. m. ♀ 21 m. m. *Habitat*, Philadelphia, one ♂; Texas, one ♂, two ♀'s. The types are in the collection of the Buffalo Society of Natural Sciences, The Texan male has the primaries darker, more streaked with brownish. This and the slightly smaller size caused me at first to suspect a distinct species in the Texan specimens. The darker greasy tinting of the primaries will probably prove variable in disposition.

SYNONYMICAL NOTE.

Adelocephala albolineata, Grote & Robinson.

Proc. Ent. Soc. Phil., plate i, fig. 7, ♂, vol. 6, p. 7, 1866, has been re-described as follows:

Adelocephala vaspa, Boisduval.

Ann. Soc. Ent. Belg., Tome xv, plate iii, fig. 1, ♀, p. 93, 1872.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 176.

ERRATA.—For *Eidothoa*, p. 186, read *Eidothea*.

Since the preceding accounts of the genera *Evippe*, *Eidothea* and *Helice* were sent to the publishers, I have taken a single specimen of the species described below. Its small size, general appearance and the tufts of raised scales at first inclined me to place it near *Laruna;* but a closer examination shows it to belong to the *Gelechidæ*, and to the same group (or subsection of *Gelechia*) with *Evippe*, &c. and *Gelechia difficilisella*. I am not altogether satisfied that I am right in separating these species from *Gelechia*, in the present heterogeneous condition of the group called by that name. But that group is already so large, and contains such a mixed assemblage of small moths, that the existence of such a group is rather a hindrance than an assistance to the student of the *Tineina*, unless, indeed, he is content to use it as a mere limbo to which may be consigned anything allied to the *Gelechidæ* which cannot be satisfactorily located elsewhere.

Neither am I entirely satisfied that I am right in separating these genera, *Sinoe*, *Agnippe*, *Evippe*, *Eidothea*, *Helice* and *Taygete (vid. post)* from each other, so nearly are they related, yet the process of division once begun I have not found it practicable to separate them otherwise than as above indicated.

The species described below resembles *Gelechia difficilisella* and *Helice pallidochrella*, and even *Gelechia obliqui-strigella* in the pattern of coloration. From the latter, however, it is distinct as to the neuration, whilst in this respect it closely resembles the two former, as it does also as to the palpi, whilst it differs from them decidedly by the absence of the tongue. In the hind wings the apical branch of the subcostal is delivered below the tip in this species, instead of at it as in *Gelechia difficilisella*, and in this respect only do the hind wings differ; and the only difference in the fore wings is the wider angle between the first and second branches

of the median in this species than in *difficilisella*. I should certainly have considered them congeneric, but for the absence of the tongue in this species, which likewise has raised tufts upon the fore wings. So close is the resemblance otherwise, and so rare the occurrence of a species allied to *Gelechia* without a tongue, that I suspected it might have been broken off; but I could discern no vestige of it, and the adjacent parts were uninjured. Both in this species and in *G. difficilisella* the terminal joint of the palpi is decidedly shorter than the second, which is scarcely thickened towards the apex. The characters of *G. difficilisella* as given *ante v. 4, p. 192*, will answer for those of this genus, with the changes above suggested. The form of the wings and neuration of *Evippe* are the same, except that the subcostal vein of the hind wings attains the costal margin *before* the apex, instead of attaining the apex as in *difficilisella*, or the dorsal margin as in this genus, and does not send off a branch to the costal margin as in both of the others. In the fore wings *difficilisella* and this genus send two branches from the discal vein to the posterior margin; in *Evippe* there is a single furcate branch which, like the two separate branches in *difficilisella*, arises about the middle of the discal vein, whilst in this genus they arise close together and to the the median vein. The palpi in *Evippe* are more elongate and slender, with the scales more appressed, and the terminal joint is if anything a little longer than the second. *Eidothea* scarcely differs from *Evippe* as to the palpi and resembles it in ornamentation, but the posterior wings are more excised beneath the tip, and have no discal branch vein, and the discal branch vein of the fore wings is simple and nearer to the median vein. The neuration of *Helice* is that of *Eidothea*, except that the costal vein in the hind wings goes to the tip instead of attaining the margin before it, and the wing is even more excised beneath the tip, and in the fore wings there is no discal branch vein, but the apical branch of the median is furcate. The palpi, however, resemble those of *G. difficilisella* more than those of *Eidothea*. *Agnippe* is more distinct, though the neuration of the fore wings only differs from that of *Evippe* in having only two instead of three subcosto-marginal branches before the end of the cell. It resembles the species described below in the presence of raised tufts on the fore wings, but the position in repose (resting upon the face with the apex of the body elevated) is nearer to that of *Argyresthia* than *Gelechia*, and the length of the third joint of the palpi, relative to that of the second joint, is rather greater than in *difficilisella*, though less than in *Evippe*, and the form is more robust than that of either of the other sub-genera.

SINOE, *gen. nov.*

Generic characters as above and *ante v. 4, p. 192.* It is perhaps necessary here to advise some correspondents that specimens which they formerly received from me labelled *Sinoe ambroseaiella* — the name formerly attached to them in my cabinet before they were carefully examined — belong to a somewhat aberrant species of *Butalis (B. matutella*, Clem.) and are not congeneric with the species described below.

S. fusco-palidella. N. sp.

Pale sordid fuscous; third joint of the palpi white, with two wide dark brown annulations. Face with faint purplish reflections. On the fore wings, just within the basal fourth, is a dark interrupted dorsal streak of raised scales, pointing obliquely backwards towards the middle of the wing; behind this streak and just within the dorsal margin, is a minute tuft of dark brown raised scales, margined behind by a few whitish scales: nearly opposite to this minute spot, but a little behind it, is a somewhat larger one similarly margined; further back, just within the dorsal ciliae, is a rather large dark brown patch of raised scales, which is internally margined by a dark brown streak of scales not raised, which passes back through the middle of the apical part of the wing but does not go to the apex; just beyond this streak is a small oblique costo-apical dark brown streak which attains the costal margin close to the apex; there is a row of dark brown spots around the apical margin, and there are three indistinct pale brown oblique costal streaks, one before the middle, one about the middle, and one just before the ciliae. In some lights these three costal streaks or stains are invisible. There is also a small brown spot about the middle of the base of the fore wings, and there are also some small ones on top of the thorax, two of which are on the posterior margins just before the apex. *Al. ex.* 3/8 inch. Kentucky.

TAYGETE, *gen. nov.*

I erect this genus for the species which, as the name indicates, I have found it difficult to locate, the species referred to above as *G. difficilisella.* Recognizing its differences from the true *Gelechia*, I at first *(ante v. 4, p.*

65) placed it in *Evagora*, to which it makes an approach in some respects, but as it could not with strictness be placed in that genus, I removed it (*v. 4, p. 192*) to *Gelechia*. But unless *Gelechia* is to remain a miscellaneous waste box, it cannot properly be placed there, and I therefore erect this genus for it. See *v. 4, pp. 65 & 192* for the generic and specific characters.

REMARKS ON LIMENITIS PROSERPINA AND ARTHEMIS.

BY W. H. EDWARDS, COALBURGH, W. VA.

It seems probable to me that *Limenitis proserpina* will be found related to *L. arthemis*, the two being forms of one species, as in *Grapta comma* and *dryas*, and I desire to call the attention of Lepidopterists who live where these species or forms are found, that they may observe them from this point of view. They are alike in size and shape, and so far as my experience and that of Mr. Mead goes (confined in both cases to the Catskill Mountains), they are always associated. I notice in a late paper by Mr. Grote that among a number of *arthemis* taken in western New York, was a certain proportion of *proserpina*. The under side of these two forms, excluding the white band, is essentially the same thing. I should like to know the Northern range of *proserpina*, and whether up to the limit of such range it is found wherever *arthemis* is found; and whether it is anywhere found where *arthemis* is not; and whether it is known anywhere to associate with what is undoubtedly *ursula*.

I formerly received large numbers of *arthemis* from high up in British America, Slave Lake to Fort Simpson, and with them were no specimens of *proserpina*. Like the black female of *turnus*, the last may have a limit beyond which it does not pass. On the other hand, the range of *arthemis* is limited to the south, and I am not aware of *proserpina* having been found apart from *arthemis*, while *ursula* swarms throughout the low lands of the Middle States, and throughout the South. If *proserpina* is found nowhere but with *arthemis*, this fact and the several points of resemblance between the two forms, makes the dimorphism probable. But it still remains to be proved beyond question by breeding, that these forms

are species from eggs laid by captive females of one or either, and this can easily be done, in the way I have elsewhere indicated, by any one taking the trouble to attend to the matter on the spot. A strong point in favor of the identity of these forms would be a great similarity between the larvæ that produce them. The young larva of *arthemis* I know, and it is essentially different from that of *ursula*. I expect the larva of *proserpina* to exhibit the form of *arthemis*, and not of *ursula*. It would not be difficult to establish the facts one way or other next spring, to some of your readers.

NOTE ON CATOCALA WALSHII, EDWARDS.

BY AUG. R. GROTE, BUFFALO, N. Y.

I have received, through the kindness of Mr. C. V. Riley, a specimen of this fine species which has been heretofore unknown to me. It is, perhaps, a little larger than *unijuga* and very different in character (also, therefore, distinct from *junctura*, from my recollection of that species in the British Museum); it resembles the European *elocata* in the appearance of the forewings: these are evenly intensely powdered with dark scales on a grey ground color which becomes yellowish brown over the median spots and subterminal space. The species thus differs strongly from *Meskei*, in which the forewings are pale grey and resemble in color more distantly those of the European *electa*, or perhaps our American *parta*. There is a more prominent discal tooth on the t. p. line in *Walshii*, wanting in *elocata*. On the hind wings the median band is much as in *Arizonae*, narrower than in *Meskei* or *unijuga* (in which it is broadest) and not continued below vein 1, whereas in *elocata* it attains the internal margin. Beneath, the band is narrower than in *elocata*, and also non-continuous. The median spots on the fore wings above are more like *elocata* than *unijuga*. On the hind wings the inner edge of the marginal band is much as in *Arizonae*, *even*, not ragged as in *elocata*; the ante-postical sinus is *cleanly cut*. Beneath, the white bands on the primaries are broader than in *elocata*, and even than in *unijuga*, and the space between the median band on the hind wings and the marginal band is wider on either surface in *Walshii* than in either of its allies. The red of

the hind wings is more pinkish, like *Arizonae* (a species totally distinct in the color and markings of the primaries), and brighter than in *elocata*, not like *unijuga*, where it is less pinkish and more like *parta*. My specimen of *Walshii* expands 82 m. m.; *elocata* averages about 78 m. m. The band in the European *nupta* on the hind wings is abbreviate, discontinued, broad and angulated or elbowed, hence very different from our American *Arizonae*, *Meskei* and *Walshii*, in which, though discontinued, it is not angulated, but is narrower, hardly constricted and straighter and longer. Although, judging by the fore wings alone, we should set down *Walshii* as "representing" *elocata* in America, the very different hind wings separate the two species very clearly. Perhaps *unijuga* is more like *elocata* in the hind wings, and *Walshii* in the appearance of the primaries; hence the European *elocata* seems a compound of both of our species.

BOOK NOTICES.

Fifth Annual Report on the Noxious, Beneficial and other Insects of the State of Missouri. By C. V. RILEY, State Entomologist.

This valuable report, consisting of 160 pages, 8vo., is full of interest to the agriculturist as well as the entomologist, detailing as it does the habits and history of many of the foes which the farmer and fruit-grower is obliged to fight. It opens with a chapter on collecting, studying and preserving insects, which is followed by one on noxious insects—notes of the year. In this latter, among other interesting matters, a discovery is announced which will probably prove to be a very important one, that of the finding of two parasitic insects which attack the worm of the Codling Moth. One of these *Pimpla annulipes* is said to have been common in the West during last year, Mr. Riley having obtained 21 parasites from 162 cocoons of the Codling Moth.

A large space is devoted to the Grape Phylloxera, an insect whose ravages, especially in Europe, appear to be exciting increased comment; it is one also to which Mr. Riley has paid special attention. Further observations on the Oyster Shell Bark Louse are recorded, also on the Pine Leaf Scale Insect. Following these are chapters on "Eggs in and on Canes and Twigs," "Stinging Larvæ," "The Goat-weed Butterfly,"

and the Yucca Moth. The work throughout is admirably illustrated with seventy-five wood cuts, most of which have been drawn from nature by Mr. Riley himself. We heartily commend this excellent report to all those interested in Entomology, and we feel assured that the valuable series of reports which have from time to time been issued by this pains-taking observer, have done very much in the way of instructing the readers in this important branch of natural history, while the practical remedies suggested for the various insect pests have no doubt been the means of greatly lessening the yearly loss occasioned by them.

Third Annual Report on the Noxious Insects of the State of Illinois. By Wm. Le Baron, M. D., State Entomologist.

Dr. Le Baron is doing good work also in Illinois. His third report contains 76 pages 8vo., and is illustrated with occasional wood-cuts. It is divided into two parts; the first part treats of insects injurious to the Apple and the Cotton Wood, to which is appended a chapter on the transportation of useful insect parasites. Among apple insects the history of the codling worm is minutely detailed and interesting tabular statements given of the results of using bandages on the trees as traps for the worms. The second part is devoted to "Outlines of Entomology," in which reference is made to the structure of insects both internal and external—their metamorphoses, instincts, their classification and division into orders. The extensive circulation of such yearly reports as these two we have referred to cannot fail to increase the interest already felt in Entomology among a large class of intelligent agriculturists.

Bulletin of the Buffalo Society of Natural Sciences—Nos. 2 and 3.—No. 2 opens with an excellent paper on new species of Fungi, by Charles H. Peck, in which appear descriptions of 132 new species, a most valuable contribution to our knowledge in this department of natural history. From the fertile pen of our esteemed friend, Aug. R. Grote, there follow: "Contributions to a Knowledge of North American Moths," and "A Study of North American Noctuidæ." In the former paper the author makes some suggestions in reference to classification, and in both are contained many descriptions of new species, which are illustrated by two lithographic plates; full catalogues are also given of the species in many families, with recent corrections as to names. In these papers are evidences of much and careful stndy; Mr. Grote well deserves the hearty thanks of all American Lepidopterists for his zealous labours.

Part 3 contains a paper on the distribution of North American Lichens, by Heny Willey, and *seven* papers by Mr. Grote, on our Lepidoptera. In one of these, "Descriptions of Noctuidæ principally from California," there are descriptions of twenty-five new species, besides numerous interesting notes on many previously described. We trust that this excellent publication will meet with that cordial support from Entomologists which it deserves.

Synopsis of the Histeridæ of the United States. By GEORGE H. HORN, M. D., Philadelphia, 8vo., p.p. 87, with one plate.

We are indebted to the author for a copy of this synopsis, a most valuable contribution to our knowledge of the Histeridæ. We sincerely hope that this elaborate publication may do much towards clearing up the obscurity which has so long attached to many of the species composing this difficult family of Coleoptera.

INTIMATION.—A letter from Mr. J. Behrens, San Francisco, California, with several interesting papers received from other esteemed contributors, are unavoidably deferred until next month for want of space.

BOOKS RECEIVED.

Synopsis of the Histeridæ of the United States, by George H. Horn, M. D., 8vo., pp. 87, with one plate.

Lepidoptera, Rhopaloceres and Heteroceres, No. 6, by Hermann Strecker, Reading, Pa.

Synopsis of the Thysanura of Essex County, Mass., by A. S. Packard, jr., 8vo., pp. 29.

Description of New American Phalaenidæ, by A. S. Packard, jr., 8vo., pp. 29.

Notes on North American Moths of the families of Phalaenidæ and Pyralidæ in the British Museum, by A. S. Packard, jr., 8vo., pp. 15.

Bulletin of the Buffalo Society of Natural Sciences, vol. 1, No. 2.

Prairie Farmer, Chicago.

Indiana Farmer, Indianapolis.

Maine Farmer, Augusta, Me.

Rural New Yorker, New York.

Monthly Journal of Education, November, Toronto.

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ERRATA.—Page 224—fourth line from bottom, for mine, read mire.

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EDITORIAL.

In accordance with a time honoured custom, we heartily tender to all our readers in this, the opening number of a new volume, the compliments of the season—a happy and a prosperous new year. It is meet at these annually recurring points in the history of our journal that we should briefly review the past, believing as we do that a recalling to mind the advances we have made and the encouraging success which has attended our efforts thus far will stimulate us to renewed exertion and make us hopeful and trustful for the future. Five years ago the CANADIAN ENTOMOLOGIST made its first appearance as a small eight paged magazine. Our members were scarcely sanguine enough to hope for a regular monthly issue even of this size, so in the opening number its appearance was promised occasionally, as material should accumulate; but our success has been beyond our expectations, the issue of our journal has been tolerably regular up to the present time; we have gradually increased its size from eight to twenty pages; have risen from common white paper to finely finished toned paper, have embellished our pages with many beautiful wood-cuts, and have presented to our readers from time to time Entomological matter in such variety as we trust will have met the views and wishes of all those who have favored us with their patronage. The work which our late esteemed Editor has so successfully carried on we shall, with his assistance and that of our other coadjutors, endeavour to continue.

To those who have aided us by their valuable contributions to our pages we are especially grateful, and we sincerely hope for a continuance of these esteemed favors. Pressed as we are with a burden of other work, we trust our friends will continue to forward their papers without waiting for personal solicitation. We propose to continue the monthly articles on our common insects, and also to furnish such gleanings in our

summary as we think will interest the general reader, while at the same time we shall endeavour to maintain for our journal that scientific standing which gives it value in the eyes of so many of our co-laborers in the Entomological field.

We feel persuaded that our readers will not overlook the fact that this festive season is the time also for renewing their subscriptions; money is a motive power in our operations which we cannot overlook. This gentle hint will no doubt be heartily responded to, and we trust that while our members bear in mind their own liabilities in this matter, they will also try to induce as many of their friends as possible to join our ranks, so that the circulation of the ENTOMOLOGIST may be greatly increased.

ON SOME OF OUR COMMON INSECTS.

11. THE TIGER SWALLOW TAIL—Papilio turnus, Linn.

BY THE EDITOR.

All our readers must have seen the large tiger swallow tail butterfly floating about in the warm days of July and August, enjoying the

Fig. 1.

sunshine and sipping the honey from flowers. It is among our largest and handsomest butterflies. In figure 1 we have an excellent represen-

tation of it. When its wings are expanded this insect will measure about four inches across. The ground color of its wings is a pale lemon yellow, which is banded and bordered with black ; on the fore wings are four black bars, the inner one extending entirely across the wing, the outer ones shortening more and more as they approach the apex. The front margin is edged with black, and the outer margin has a wide border of the same in which is set a row of eight or nine pale yellow spots, the lower ones less distinct.

The hind wings are crossed by a streak of black which is almost a continuation of the inner band on the fore wings ; there is a short black streak a little beyond at the end of the discal cell, and a wide black border widening as it approaches the inner angle of the wing. Enclosed within this border and towards its outer edge are six lunular spots, the upper and lower ones reddish, the others yellow ; above and about these spots and especially towards the inner angle of the wing, the black bordering is thickly powdered with blue scales. The outer margin of the hind wings is scalloped and partly edged with yellow ; the inner margin is bordered with dusky for about two-thirds of its length, followed by a small yellow patch, which in turn is succeeded by a larger black spot centered with a crescent of blue atoms and bounded below by an irregular reddish spot margined within with yellow. The hind wings terminate in two long black tails, edged on the inside with yellow. The body is black above, margined with pale yellowish ; below yellowish streaked with black.

The under surface of the wings somewhat resembles the upper, but is paler.

This species passes the winter in the chrysalis state, and appears first on the wing from the middle to the latter end of May, but becomes much more plentiful during July. Whether these July insects are a second brood, or whether the bulk of the chrysalids which have wintered do not mature until about this time we are unable to determine ; individuals which we have wintered over have escaped from chrysalis as late as the 3rd of June.

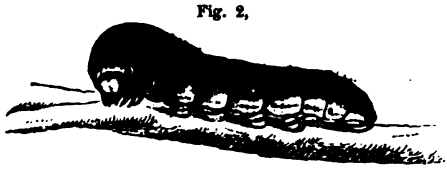
The eggs of *turnus* are deposited singly on the leaves of the different plants or trees on which the larva feeds. They are between one-twentieth and one-twenty-fifth of an inch in diameter, sub-globular, flattened at the place of attachment ; colour dark green, surface smooth, without reticulations, but showing a few small irregularly distributed spots under

a magnifying power of forty-five diameters. In about ten or twelve days they begin to change colour, becoming darker, and very dark just before the young larvæ are hatched.

When fresh from the egg the larva is about one-tenth of an inch long, with a large black head and with a black body roughened with small brownish black tubercles. The second segment is elevated or thickened and of a dull glossy flesh colour, with a prominent fleshy tubercle on each side and a patch of white on the seventh and eighth segments, wide anteriorly, pointed behind; there is also a dull flesh coloured streak along the back on fourth and eleventh segments. The twelfth segment has a pair of fleshy tubercles rather prominent, but not so large as those on the second; both those on the second and twelfth have several short whitish hairs arising from them. The under surface is brownish black, with the feet and prolegs of the same colour.

The full grown larva, see figure 2, taken July 14th, measured one and a half inches in length. Its head is rather large and of a reddish brown colour, sprinkled with very short white hairs.

Fig. 2,



The body above, green, of a slightly darker shade on the anterior segments, paler on the sides of the body, over which there is a whitish bloom produced by a multitude of very minute white dots, with small short hairs of the same colour issuing from them; the anterior segments of the body are wrinkled. On the front edge of the second segment is a raised yellow fold slightly overhanging the head, and on each side of the fourth segment is an eye-like spot, nearly oval in shape, yellow, encircled with a ring of black, centered with a small elongated blue dot, which is also set in black and has above it on each side a black line nearly crossing the yellow spot. On the hinder portion of the fifth segment is a raised yellow fold, bordered behind with rich velvety black, the latter visible only when the larva is in motion; on the terminal segment is a similar fold flattened above, with a slight protuberance on each side. On the fifth segment, in front of the yellow fold, are two blue dots, one on each side of the dorsal line; there are also faint traces on the hinder segments of a continuation of these dots in longitudinal rows.

The under surface is of a paler green than the upper, with a whitish bloom; prolegs of the same colour, feet tipped with brown.

As the larva approaches maturity and is about to change to a chrysalis, the colour of the body gradually grows darker until it becomes dark reddish brown, the sides nearly black. The minute whitish granulations and the blue dots become much more distinctly visible, giving the larva a very different appearance. It then selects some suitable spot in which to pass the chrysalis state, where it spins a web of silk in which its hind feet are entangled, and having prepared and stretched across a silken band to sustain its body in the middle, it casts its larva skin and remains a dull brownish chrysalis until the following spring.

This insect is widely distributed, being found throughout the greater portion of the United States and Canada. The larva feeds on a number of different trees, but chiefly affects with us the apple, cherry, thorn and basswood.

THE USE OF APHIS-EXCRETION AND BENEFIT DERIVED THEREFROM.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

It is well known to the popular as well as scientific world that the *Aphides* secrete or rather excrete a peculiarly viscid and honey-like fluid which forms one of the chief delicacies of Ants. That it was originally designed to form an article of food for the latter is a supposition that cannot be entertained for a single moment; but that it is in some way connected with the preservation of the soft and tender beings by which it is manufactured, there can be no reasonable doubt. Various opinions have been hazarded, and not a few theories devised to account for its probable origin and use and the material benefit which it secures to the authors thereof, but these have been of such an unsatisfactory character as not to merit the approval of the learned.

While some writers have surmised its application to be connected in some way with the wants of the newly-born *Aphis*, still the lack of evidence confirmatory of any such surmise has caused it to fall into neglect and disuse.

That this fluid has both a primary and a secondary purpose to subserve in the economy of the plant louse is a fact the truth of which stands off as gross as black from white. Recently, while engaged in the study of the

Aphis which particularly infests the blossoms of *Cucurbita ovifera*, I had the happy satisfaction of being a witness of a phenomenon which promised to solve the knotty problem. After a few moments of calm and deliberate reflection upon what I observed, the entire theory, the details of which I am about to delineate, became almost intuitively outlined upon my mind.

Feeding upon the flowers of this plant were hundreds of lice, the groupings of which not even a careless and hasty observer could fail to detect. There, like the patriarchal tribes we read about, were observable group after group, each composed of a head and a family of children of diverse ages and sizes. In the arrangement the young and newly-born, as if requiring the first care and earliest attention of the mother, were closely in her rear, the proximity to her presence in the case of the residue being apparently determined by their age.

While intently scrutinizing the actions of the various groups, one little fellow was observed to caress its parent by means of its antennæ, as if soliciting the bestowal of a favor. After the lapse of some few seconds the mother, acting in obedience to the child's wishes as thus expressed, slowly elevated the posterior part of her abdomen and ejected a honey drop upon the head of the latter, apparently to its infinite delight and satisfaction. It is my honest opinion, evidenced by repeated observations, that it is only during the first two days of the life of the offspring that this process of feeding is necessary, the digestive organs at this period being too feeble and delicate to partake of the strong juice of the flower without the entailment of injury. But after undergoing remarkable changes in the alimentary laboratory it becomes deprived of its injurious properties and rendered fit for the sustenance of life.

In conjunction with the previous discovery I remarked that the older and stronger seldom, if ever, deviated from the path over which their maternal head had passed, but seemed to find their chief good attained by following closely therein. It seems just to conclude that this would not be if they were amply qualified to look after their own temporal welfare ; but on the ground that parental provision and attention are still indispensable, the reason is obvious.

Plant lice being vigorous feeders, the manufacture and excretion of this fluid would necessarily be very great and profuse, and as nature does not work in vain, it might be argued that it is a sort of compensation which the insect lavishes upon the plant for the losses which it

momentarily sustains. But to this opinion I cannot assent, as experience teaches me that the plant does not receive the least benefit therefrom. Even if it possessed any healing virtues, these could not manifest any marked effects, owing to the very rapid multiplication of the lice, which are constantly probing the wounds by means of their puctorial apparatus and thus serving to heighten instead of lightening the evil. Viewing the subject in this light, nature would seem to be defeating her own ends.

It is true that these highly mischievous creatures are slightly held in check by a few species of the Ichneumonidæ, Syrphidæ and Coccinellidæ, but their rate of increase is so enormously out of proportion to the number of their enemies that very little good results to plants.

From the preceding remarks it is evident to the mind of every candid reasoner that plants receive no material advantage from this excretion. It now remains to indicate its use. That it is of great service to the newly born *Aphis*, totally unfitted as it is both by nature and by structure to imbibe the strong, yet sometimes acrid and bitter fluids of plants, there can be no doubt. But as the supply is clearly above the requirements of such, why the excess? Most assuredly to serve as *pabulum* for their stronger companions. How? By uniting with the plant's forced excretion, thus diluting and rendering it a suitable material for imbibition and digestion. That its primary use is to serve as food for the lice during their early existence I think from the argument adduced must be obvious to all.

That a secondary purpose also is subserved thereby, to wit, the preservation of the species, there are just grounds for belief. It is well known to naturalists that ants do not merely possess a fondness for sugar, gums and saccharine solutions, but that they also manifest a decided penchant for the rich juices and tender tissues of animals; the liquids aud solids of humbler forms of insect life being sought after and devoured with avidity, save when the animals possess some peculiar properties that recommend them to the mercy of their enemies.

There is no doubt that the soft and juicy *Aphis*, which is esteemed such a rich morsel of food by the *Coccinella*, was primitively as delicious to the *Formica*, and that it shared equally with other feeble creatures of its class the murderous assaults of the latter. This condition of things doubtless continued for ages, until there appeared on the scene an ant possessed of more sagacity than any of its fellows.

This ant having discovered the hidden virtues of the *Aphis* excretion there would dawn a new era in the history of the two species. The news of this discovery would doubtless become diffused not only through the colony of which this ant formed a part, but through the entire species and kindred species, for the *Formicidæ*, as is well known, exhibit in a remarkable manner the power of communicating their thoughts, wishes, &c., to each other.

As ants are endowed with a high degree of intelligence, considering the place which they occupy in the scale of created existence, they would not be slow to perceive that their chief good would be best attained by taking under protection the little creatures which are the authors of this luxury. From this time the ants would gradually abandon their sanguinary propensities, and little by little manifest their solicitude and regard for the latter by gentle strokes and caresses. The lice in turn perceiving the latter's disposition to friendliness, would cease by degrees to regard them as enemies, and would learn to cater to their physical wants. Thus would be developed these amicable relations which are known to exist between them, and which so admirably tend to their mutual good.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 232, vol. v.

BUTALIS.

B. fuscicomella, Clem.

B. flavifrontella, Clem.

Both of these species occur abundantly in this locality; but the latter (my specimens can be nothing else) has the apical vein furcate before the apex, whilst Dr. Clemens says that it is simple. Mr. Stainton says it may be *B. basilaris*, Zeller.

B. matutella? Clem.

I am not altogether certain that my specimens belong to this species which I know only by Dr. Clemen's description. The neuration of the wings in my specimens is the same with that of Dr. Clemen's species as

given by him ; but there are some structural points in which it differs from *Butalis*, and Dr. Clemens' specific description is applicable to only a small proportion of individuals out of the many that I have examined. My specimens have been bred from larvae found mining the leaves of the great hog weed *(Ambrosia trifida)* and various species of Aster *(A. ericoides* and *A. sagittifolius)*. It spins a small web on the under side of the leaf from which it passes into the leaf, eating out the parenchyma in small patches. It makes several mines before passing into the pupa state. The mine is at first convoluted, narrow and filled with frass, but soon becomes a clear transparent blotch somewhat like the mine of *Bedellia somnulentella* in leaves of the morning glory *(Ipomea)*. It pupates in a dense web which it spins around itself, and which is but slightly attached to the surface of the leaf.

In the imago state the tongue is scaled at the base only, the wings are carried slightly deflexed in repose instead of being folded around the body as in the true species of *Butalis*. The primaries have only three instead of four veins beneath the apical one, and the head is rather less obtuse and is scarcely at all retracted. I had at first inclined to erect for it a new genus, and specimens in my cabinet were labelled *Sinoe ambrosiaecella*, and have been distributed to some correspondents under that name. The neuration of the wings is very similar to that of the genus *Aybia*, but the palpi are very different.

The imago is shining bronzy dark brown, with a purplish tinge. Usually there is a whitish yellow spot on the fold of variable size, sometimes spreading to the dorsal margin, sometimes scarcely discernible, and sometimes absent: there is always a distinct streak of the same hue at the beginning of the dorsal cilia, and a white patch on the abdomen beneath near the apex. *Al. ex.* ½ inch.

The larva is at first white with green contents ; then a small black spot appears on each side of the first segment, and afterwards a series or line of similar spots extends along the entire length of the larva and ultimately they become purple. In the later larval stages a purple line appears on each side of the median one. There is a small blackish spot behind each eye. In the adult larva the 9th and 10th segments become purple on top and the purplish longitudinal lines above mentioned are connected on the posterior margin of each segment by a transverse band of the same hue. It has sixteen feet, the thoracic ones being piceous. It may be found in all of its stages from June until the fall of the leaves.

ARGYRESTHIA.

A. oreasella. Clem.

Mr. Stainton states in his edition of the Clemens papers that this is the European *A. andereggiella.* It is the only species of the genus heretofore described from this country. I have never met with it in this locality but have received from Mr. Wm. Saunders several specimens with the information that they were all taken whilst resting on the leaves of a thorn bush *(Crataegus ——— ?).* In my specimens there is nothing that can be called an 'eye cap' only a few long scales pendant over the eyes from the elongate basal point of the antennæ, and the body, wings and antennæ more slender than in the species described below as *A. undulatella.* The neuration of the wings in *oreasella* is exactly that given by Mr. Stainton *(Ins. Brit. Lep. Tin., p. 3)* for *A. nitidella.*

A. undulatella. N. sp.

Not having recognized this as a true *Argyresthia* formerly, it was labelled in my cabinet *Chalciope undulatella,* and has been distributed to some correspondents under that name, and also under the names *Polyxo undulatella* and *Albunea undulatella.*

It is more robust than *oreasella,* the primaries are wider, the tuft on the vertex is larger, the basal joint of the antennæ is enlarged and has a distinct eye cap; the antennæ are much more robust and each joint is clothed with rather spreading scales so that it is enlarged towards its apex, the succeeding joint being inserted in the centre of its apex.

The neuration of the primaries is like that of *oreasella,* but in the secondaries the discal vein is absent from the subcostal to the first branch of the discal, so that the cell is partly unclosed.

I have named the species *undulatella* from its habit of 'see-sawing' on its middle legs before it comes to rest in the attitude of the other species of the genus, resting on its head with the apex of the body and wings projecting at an obtuse angle to the object on which it rests. It is very sluggish and not easily disturbed. It is found in considerable numbers in May resting on the trunks of Elm trees. The larva is unknown.

A. undulatella. N. sp.

Palpi brownish, at base white; face white around the mouth, brownish above. Tuft and eye caps snowy white. Antennae checkered with alternate black and white spots. Thorax and dorsal half of the primaries

snowy white; costal and apical portions brownish or dark brown, sometimes dusted with white and sometimes (usually) with streaks of the white extending into the brown portions, sometimes so as to divide it into two or three brownish costal streaks. There is great variety in the shade and proportions of the whitish and brownish portions of the wing, but snow white is the characteristic color of the basal and dorsal parts and brownish of the costal and apical parts, with the line between them more or less emarginate. *Al. ex.* ⅓ inch. Kentucky.

A. apici-maculella. N. sp.

In this species the eye cap is as distinct as in *undulatella*, but the stalk is simple and slender as in *oreasella*. The neuration of the primaries is that given by Mr. Stainton for *A. arceuthina (loc. cit.)* In the secondaries it is the inferior portion of the discal vein that is absent instead of the superior, as in *undulatella;* that is the portion next to the median vein.

Shining silvery white, each joint of the antennae (except the basal one) is dotted above with dark brown. Primaries with a blackish or dark brown shining almost triangular spot at the apex, with three pale and indistinct brownish costal streaks before it; the first of these streaks is the shortest and most indistinct, and is placed at the beginning of the ciliae. The second is a little more distinct and sometimes extends entirely across the wing, and the third one always does so after dividing into two branches just before the apical spot. These streaks are usually more or less interrupted and sometimes spread over the apex so that it might perhaps be more correctly described as dusted than streaked. There is a bright though pale golden basal streak just within the costal margin. *Al. ex.* ⅜ inch. Kentucky, in oak woods, in June and July.

THE FAMILIES OF DIPTERA.

BY FRANCIS WALKER, LONDON, ENGLAND.

The two-winged flies are more important in nature than any other order of insects because of their number and diffusion, and the families may be briefly traced in succession previous to a more extended notice of each of them, in case the subject should become more interesting.

Family 1, PULICIDÆ.
" 2, MYCETOPHILIDÆ.

In the following arrangement the first manifestation of Dipterous existence is associated with the inmost recesses of man's habitation, and a few beasts and birds also partake of its presence in their dwellings. In this form it has some perfections in which it exceeds all the rest of the race, being unequalled in strength and in activity and in endurance of pressure. The dismissal of this wingless fly will be readily accepted, and there is a wide gap between it and the next form of Dipterous life wherein it is transferred to the fungoid-race, and here its work is to appropriate and elaborate the substance of the fungus and to raise it to its own level, and this will be said to be just contrary to the first scene in which it reduces the circulation of the vertebrata to its own purposes. In the second scene the fly has in some cases much resemblance in the body and in the legs to the first family, but the strength and the activity are comparatively passed away, and the structure of the mouth is much changed and much less effective; however, it has a compensation in the possession of wings. Even in the small extent of England there is yet much to learn about the fungus-flies, but there is a much wider field for observation in Canada and in the more northern regions of America where the gradual diminution and cessation of the race may be traced. Winnerty has contributed much more than any one else to the history of this family, and his synopsis of the sub-families is here translated:

A—Middle transverse vein elongated.
a—Brachial vein wanting.....1 Diadocidinæ
b—Brachial vein present.
*—Antennæ not very long.
†—Brachial vein long.....2 Mycetobinæ
† †—Brachial vein short.....3 Ceroplatinæ
* *—Antennæ very long.
†—Antennæ setiform.....4 Bolitophilinæ
† †—Antennæ filiform.....5 Macrocerinæ
B—Middle transverse vein not elongated.
a—Brachial vein present.....6 Sciophilinæ
b—Brachial vein wanting.....7 Mycetophilinæ

NOTES ON NOCTUIDÆ.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

Agrotis badinodis, Grote.

♂. Antennæ pectinate. All the tibiæ armed or spinose. Abdomen a little flattened. Body slender; wings ample and wide. Nearest to *Agrotis collaris*, but with wider wings, and larger and differently colored. Smooth, pale brown. Transverse lines even, with coincident pale shades. Basal half-line evident; on the sub-basal space a pale dot followed by darker scales situate on median nervure. Transverse anterior line straight, touching the broader superior portion of the large orbicular on subcostal nervure, and leaving on the disc an intensely blackish brown space to obtain between the narrower lower portion of the orbicular and the line. Reniform, like the orbicular, concolorous, with narrow pale edging, hardly as large as the orbicular and broader below than above. Space between the spots deep, faintly reddish brown, deepening to median nervure. The diffuse median shade apparent below median nervure. Claviform large, concolorous, indistinctly limited. Transverse posterior line even, regularly arcuate, much as in *collaris*. Subterminal space dark reddish brown; subterminal line faint, narrow, irregular, pale; terminal space paler, less reddish brown than the subterminal. Terminal line broken into minute dots; fringes dark.

Hind wings concolorous, dark silky fuscous, with pale fringes. Beneath with a reddish brown tinge; a common diffuse fuscous line, and a dark discal spot on the hind wings which are palest and notably irrorate. Collar dark, thorax pale brown; abdomen like hind wings. *Expanse*, 35 m. m. *Habitat*, Maryland (coll. Lintner, No. 2506.)

The antennal pectinations are longer than in *triangulum*, the color different, the orbicular differently shaped.

Eurois occulta.

I have determined this species in the collection of Mr. Lintner, from New York, and in that of the Laval University, Quebec. It is a robust form, resembling *Mamestra nimbosa* in appearance, but structurally distinguished by the naked eyes, spinose fore tibiæ and excavated genital

pieces. It should be considered as the type of Hubner's genus *Eurois*, a name which has priority over *Aplecta*, and is cast for the same species, most of which, as Lederer has shown, are not properly separable from *Mamestra*. *Polyphaenis* seems to me equally valid with *Eurois;* I am not therefore agreed with v. Heineman's fusion of the species of the two genera under the name of *Aplecta*. The late Mr. Walsh has already referred to this species as found in this country. The list of species common to both continents, given in the Proc. Ent. Soc. Phil., vol. 3, p. 214, contains, however, several errors of different kinds, and is therefore unreliable.

Luperina reniformis, Grote.

♂ ♀. Eyes naked, without lashes. Tibiæ all unarmed. Maxillae weaker than in *Hadena*. Abdomen conical, apparently without tufts in the ♀, with longer dorsal depressed scales in the ♂, in either sex not with the thick squamation of *Hadena*. A little larger than *Hydr. sera*, which it resembles, but is more blackish, and the reniform is contrastedly annulate with white scales which usually extend along veins 3 and 4 at base, as in *Haworthi*. Beneath the thoracic squamation is somewhat woolly. Blackish brown; suhterminal space usually contrasting by its pale ochreous color. Median space wide. Orbicular an oblique finely and faintly pale ringed annulet, concolorous with the wing. Claviform indistinct, black. Reniform very narrow, its base visible between veins 3 and 4, neatly ringed with pure white, preceded by a pale vertical streak which appears to cover the closure of the cell, but which is probably part of the true outer annulus of the spot. Median shade black, irregular, faint. T. p. line accentuated on the nervules, even, pale between double lines, not retreated on cell 2, followed by black nervular dots on the subterminal space. Subterminal line preceded by a dark brown shade which shows some more determinate shade marks, produced opposite the median nervure. Terminal space black, narrow. Interspaceal terminal black dots. The narrow brown fringes cut with pale at extremity of the veins. Hind wings pale fuscous with soiled veins, beneath with distinct dot and faint transverse line. Varies by the darkening of the subterminal space, and obsolescence of the pale scales on the median nervules. Antennnæ simple in both sexes. *Expanse* 36 m. m. *Habitat* Canada; New York (Mead, No. 120; Lintner, No. 3588 and No. 3741 var.) Collection of Buffalo Society N. Sciences.

Hadena fractilinea, Grote.

♀. Eyes naked, with lashes. Thorax with anterior and posterior crests; the dorsal abdominal tufts are minute. Legs unarmed. Size moderate; squamation smooth. Dull blackish and very pale dull carneous brown. The pale color obtains along the internal margin of the fore wings and largely subterminally, extending to the apices without the undulate ferruginous subterminal line. The blackish color obtains at base and superiorly along costal region, and surmounting the pale subterminal space and over the constricted terminal space. The contrast between the two tints is variably strong, the blackish color becomes in some specimens dull brownish and the pale tint obscure and dusky. The median space is blackish above submedian fold, narrowed inferiorly; the ordinary spots small, orbicular concolorous with a fine pale annulation, reniform with the centre of the paler shade of the wing, with a dark internal streak. Transverse posterior line incompletely geminate, followed by a series of minute black and pale nervular dots. The twice prominently undulated subterminal is preceded by a more or less obvious ferruginous shade. Fringes black, narrowly cut with pale at the extremity of the veins. Hind wings concolorous brownish grey, rather dark, without lines; fringes pale with a narrow dark internal line. Beneath paler, dusted with dark scales, with a purplish or carneous tinge and a tolerably distinct exterior common line, more denticulately waved on secondaries. Patagia mixed with blackish scales; disc and tufts paler, touched with ferruginous; abdomen like hind wings. *Expanse*, 28 to 30 m. m. *Habitat*, Canada (Pettit, No. 1594); Albany (Lintner, Nos. 3568 and 1998). Much smaller and distantly recalling *rurea* in the disposition of the colors. It has apparently also a resemblance to the European *Agrotis putris*, but is generically distinct, and differs by the dark opaque secondaries.

Hadena cariosa.

Xylophasia cariosa, Guenee, p. 144.

The median lines are more distinct than in its immediate allies. The median space is narrowed inferiorly, the large claviform extends to the transverse posterior line.

Cerastis alternata.

Noctua alternata, Grote, Proc. Ent. Soc. Phil., Vol. III.

Eastern States; New York; Pennsylvania.

Cerastis cupida.

Noctua cupida, Grote, Proc. Ent. Soc. Phil., Vol. III.

Eastern States; New York; Pennsylvania.

Telesilla cinereola.

This species is the *Placodes cinereola* of Guenee, but the generic name had been previously used, and Herrich-Schaffer in consequence proposed the present designation for the European *amethystina*, and which should be retained for our species. Lederer's term *Eucarta* is later and has been withdrawn, in favor of *Telesilla*, by its author. Hubner enumerates the European species under Trigonophora, the type of which is quite distinct structurally from *Telesilla amethystina.*

Plusia gamma, (Linn).

Habitat, California (Hy. Edwards, No. 147).

I cannot distinguish the American specimens specifically. This species has been credited to Canada by Kirby (p. 307), and also to Hudson's Bay by Mr. Walker, in the British Museum Lists.

Adipsophanes miscellus, Grote.

Habitat, California (Hy. Edwards, No. 187).

ENTOMOLOGICAL READINGS,

Suggestive and Reflective.

BY W. V. ANDREWS, NEW YORK.

"There are no satisfactory distinctions between some of the moths which enable any one to say that they are of such and such species, and very frequently they are separated into different kinds because they happen to feed on various plants, and because the moths are not all colored in the same manner. Of course the Entomologists that believe in the real nature of species have taken a vast deal of trouble with the Noctuina, but those who do not think a species to be anything more than an abstract idea, and that it really consists of the sum of the variations of a closely allied series of forms, do not see the use of this Natural History hair splitting."—*Duncan's Transf. of Insects, p. 125.*

" Many naturalists have observed that the species of *Solenobia*, one of the Tineidæ, have a most exceptional power of reproduction. The maiden females of the genus lay eggs which can be hatched so as to produce larvæ, and a naturalist may breed a species for years without seeing a male *Solenobia*. This extraordinary fact is not without parallel amongst the Lepidoptera * * * and it is common among the bees and the aphides."—*Duncan's Transf. of Insects, p. 146.*

NOTE.—To many persons there will be, I hope, nothing new in the above statement, but there are more to whom it will not only be new but also incredible. In this connection I wish to state an occurrence, which, although not quite conclusive in its character, may, if known, recall to others similar occurrences with the same species, and they may have met with more definite results.

Two years ago, wishing to rear several broods of *Eacles imperialis*, I placed a female of that species in a favorable situation for attracting the male. I had forgotten whether the male usually remained in the company of the female for a long or a short time, and watched pretty closely till 1 o'clock a. m., for the purpose of ascertaining that fact.

I was much chagrined to find that at none of my visits was there any male visible. I was up betwixt 3 and 4 o'clock, a. m., still no male; and at broad daylight the result was the same. The female had, however, laid on the branches of the tree on which she was confined about thirty eggs, and although I considered them worthless, I put them into a small box without quite knowing why. I removed the female the next night to a still more promising spot, hoping that the eggs remaining in her might still be impregnated. No trace however of a male was visible, but, by the next morning, she had laid a quantity of eggs which I secured as before.

Every one of these eggs were fertile; but now comes the curious part of the matter. Every one of the larvae were of the dark brown variety, not a green one amongst them.

Now what I would like to learn is this: Does any one know of any case in which *imperialis* has produced fertile eggs without male assistance and, if so, what color were the larvae?

CORRESPONDENCE.

SAN FRANCISCO, CAL., NOV., 1873.

DEAR SIR,—

Many printed pages you devote to the question of nomenclature and rights of priority of generic and specific names. Allow me a small space in your columns to say a word in no way personal, still from a different point of view, yet with deference to the contending opinions.

In the first place I would claim a general acknowledgement for such compilers of entomological material as have in an exhaustive way at their time—so far as exhaustion is possible—published the results of their researches, and which compilations form entireties of certain large groups of insects. I will refer to only a few, among them Burmeister, for his Rhynchosa and Gymnognatha; Gyllenhall, for his North European Coleoptera; Harold and Gemminger's Munich Catalogue of the World's Coleoptera; also, Ochsenheimer and Freitschke's work on Lepidoptera of Europe, this latter one *so* complete with Geometridæ and Micros.

All these compilers have worked with the full understanding of the value of generic names come down to them from earlier authorities, have been guided by the wish of letting Linne's and other great author's earliest names stand for the typical genus, giving room at the same time where, by newer discoveries, new genera had necessarily been created, for their interpolation. The great completeness of these published compilations, based upon conscientious researches, is what has created, if not all over the world, at least in Europe, the use and endearment of certain generic names that in my opinion might be everywhere respected, and will, I hope, everywhere and for ever be adopted. I see no necessity of going further back than the authority of such great compilers, even if a few errors of judgment, as likely, have occurred.

To restrict my observations to Lepidoptera only, I will here especially refer to Ochsenheimer and Freitschke's work of wonderful completeness; it treats of European Lepidoptera only. The European Fauna has its representatives all the world over, and it is around and between European genera that the world's new species have to be ranged, whether or not the formation of new genera becomes necessasy. Such ground work or basis for a complete series of classes and genera as O. & F. have compiled might, in my opinion, be followed up and their generic names without omission be adhered to. Addressing American Entomologists, I would

allow myself the question: Might not all controversy about generic names, whether from earlier or later editions of Linne's or from other early authorities, be dropped, and all punctilious adhesion to priority be dismissed; might not the long-familiar names on the strength of above named second-hand authorities be with safety fixed upon as final and generally acknowledged?

Yours respectfully,

JAMES BEHRENS.

P. S.—It would be well if the authors of new created generic names would give their Greek or Latin derivations.

HABITAT, ECONOMY, ETC., OF AGROTIS FENNICA, EVERSMAN.

SPRING BANK, ST. CATHARINES, ONT., DEC. 22, 1873.

DEAR SIR,—

I am very anxious to obtain information respecting *Agrotis fennica*, Eversman, whether it is an abundant species in any part of Canada or the United States, and, being a stranger in this country, would be very thankful would any gentleman conversant with the insect, kindly aid me in the pages of the CAN. ENT., by any information he may posess touching its economy in the larval state, food plant, time of year when the imago is found, or any other necessary details.

Finally, should any Entomologist have duplicate specimens to spare, I need scarcely say they will be very acceptable, and later on in the season I will do my best in return to repay the obligation, and send an equivalent in any desirable species from this neighborhood.

I have read with much interest the articles on collecting in late numbers of the CAN. ENT., especially as my experience with cyanide of potassium as a killing material induced me years ago to abandon that method. I had the material both in tight-fitting boxes and glass-stoppered bottles, in all cases the cyanide being covered with a stratum of plaster of Paris. As a killer it does admirably, but, according to my experience, it renders the moths so rigid that in setting the wings are very liable to be torn in lifting them into position. This method of killing with cyanide was, indeed, condemned years ago in England owing to this very cause.

GEO. NORMAN.

ZOOLOGICAL MUSEUM, CAMBRIDGE, U. S., DEC. 20.

DEAR SIR,—

I have commenced to study and arrange the Coleoptera in the Museum, and hope to get help on all sides, and shall be particularly glad to see specimens in the less studied groups. At present I have finished the N. American Phytophaga, and hope to work at the Staphylinidæ ere long. I also want to see all the Dytiscidae that I can, as it is only by a long series that much can be done. I shall be glad to hear from any one interested in exotic insects, also. Yours truly,

G. R. CROTCH.

LARVA OF P. BREVICAUDA.

We extract the following from a letter recently received from Mr. Edwards :—Miss Peart has drawn the larva of *brevicauda*. It differs from *asterias* larva in that the black transverse bands are broken, and no yellow spots are between them ; the lowest black spot is triangular, and so to each band. It is more like *solicaon*, although that has yellow spots. The point is that it is not *asterias*.

W. H. EDWARDS, Coalburgh, W. Va., 18th Nov., 1873.

BOOK NOTICES.

Hackberry Butterflies. Descriptions of the early stages of Apatura Lycaon, *Fabr.* and Apatura Herse, *Fabr.*, with remarks on their synonymy, from the Trans. St. Louis Acad. Science. 8 vo., pp. 14, with four illustrations by Chas. V. Riley, M. A., Ph. D., St. Louis.

On Platypsyllidæ, a new family of Coleoptera, from the Proceedings of the Zoological Society of London, 8 vo., pp. 6, with one plate, by J. L. Le Conte, M. D.

Seltsame Geschicte eines Tagfalters, von Samuel H. Scudder.

Proceedings of the Boston Society of Natural History, vol. xv, parts 3 and 4, Dec., '72 to April, '73.

Nature, to December 11th.

Science Gossip, December.

American Naturalist, December, 1873, January, 1874.

Canada Farmer, December 15 and 30.

Prairie Farmer to Dec. 27.

The Horticulturist, Nov. and Dec..

Rural New Yorker to Jan., '73.

American Agriculturist, Jan.

Maine Farmer to Dec. 27.

The Canadian Entomologist.

VOL. VI. LONDON, ONT., FEBRUARY, 1874. No. 2

THE FOOD-PLANTS OF EUROPEAN BUTTERFLIES.

BY S. H. SCUDDER, CAMBRIDGE, MASS.

Kaltenbach is publishing a work entitled *Die Pflanzen-Feinde aus der Classe der Insecten*, two parts of which have appeared and carry the investigation through the willows. He enumerates all the German insects known to feed upon particular plants; annotated lists of more than three hundred species of insects are sometimes ascribed to a single tree. Among these are many butterflies, and by collating them I have prepared the following list, believing that, as it is fuller than any yet published, it will be of great service to those who are endeavoring to discover or extend the histories of our own butterflies. As soon as the work of Kaltenbach is completed, a supplement will be prepared to this list. The nomenclature of the butterflies is altered to make it accord with Staudinger's last catalogue.

1. *Apatura iris*—Salix caprea, S. aurita.
2. " *ilia*—Salix, Populus tremula, P. dilatata.
3. " " var. *clytie*—Populus tremula, P. canescens.
4. *Limenitis populi*—Populus tremula.
5. " *camilla*—Lonicera cœrulea, L. xylosteum, L. caprifolium, L. periclymenum.
6. " *sibilla*—Same plants as the preceding.
7. *Vanessa levana*—Urtica dioica.
8. " *œa*—Salix, Parietaria officinalis.
9. " *C. album*—Ulmus campestris, Humulus lupulus, Urtica urens, Ribes rubrum, R. grossularia, Corylus avellana, Lonicera xylosteum.
10. " *polychloros*—Pyrus communis (pear), P. malus (apple), P. cydonia (quince), P. cerasus (cherry), Ulmus, Salix, Populus, Cornus.

11. *Vanessa xanthomelas*—Populus, Ulmus, Salix caprea, S. acuminata, S. glauca, S. vitellina.
12. " *L. album*—Ulmus, Salix.
13. " *urticæ*—Urtica hispida, etc.
14. " *io*—Urtica, Humulus.
15. " *antiopa*—Salix, Betula, Populus, Tilia (Ulmus is not given.)
16. " *atalanta*—Urtica dioica, U. urens.
17. " *cardui*—Cirsium oleraceum, C. arvense, C. palustre, C. lanceolatum, Carduus natans, Malva rotundifolia, Gnaphalium arenarium, G. luteoalbum, Achillea millefolium, Artemisia vulgaris, Filago arvensis, Onopordum acanthium, Cynara scolymus, Centaurea benedicta, Urtica dioica, Carlina.
18. *Argynnis aphirape*—Polygonum distorta, Viola palustris.
19. " *selene*—Viola canina, V. tricolor.
20. " *euphrosyne*—Viola canina.
21. " *pales*—Viola montana.
22. " *dia*—Viola odorata.
23. " *daphne*—Viola, Rubus idæus, R. fruticosus.
24. " *ino*—Urtica.
25. " *lathonia*—Viola arvensis, V. tricolor, Hedysarum onobrychis, Anchusa officinalis.
26. " *aglaja*—Viola canina.
27. " *niobe*—Viola odorata, V. tricolor.
28. " *adippe*—Viola odorata, V. tricolor.
29. " *paphia*—Hesperis tristis, Viola canina, Rubus idæus, Urtica.
30. " *pandora*—Viola.
31. *Melitæa cynthia*—Plantago lanceolata, Pedicularis rostrata.
32. " *maturna*—Melampyrum nemorosum, Populus tremula, Salix capræa, Fraxinus excelsior, Veronica, Plantago.
33. " *aurinia*—Geranium sanguineum, Scabiosa, Veronica, Plantago.
34. " *cinxia*—Plantago lanceolata, Veronica, Hieracium pilosella, H. canescens.
35. " *phœbe*—Centaurea scabiosa, C. jacea.
36. " *trivia*—Verbascum thapsus, V. nigrum.
37. " *didyma* — Artemesia abrotanum, Plantago, Centaurea, Stachys, Linaria vulgaris, Veronica, Teucrium chamædrys.

38. *Melitæa dictynna*—Melampyrum nemorosum, Spiræa aruncus, S. ulmaria, Veronica.
39. " *athalia*—Melampyrum sylvaticum, M. pratense, M. nemorosum, Plantago, Veronica chamaedrys, Chrysanthemum corymbosum, Digitalis ochroleuca.
40. " *aurelia*—Plantago.
41. " " var. *britomartis*—Veronica chamaedrys, Melampyrum pratense.
42. " *parthenie*—Plantago lanceolata, Centaurea jacea, Melampyrum pratense.
43. *Nemeobius lucina*—Rumex, Primula.
44. *Thecla betulæ*—Prunus spinosa, P. armeniaca.
45. " *spini*—Rhamnus saxatilis, R. cathartica, R. frangula, Prunus spinosa, P. domestica.
46. " *W. album*—Ulmus campestris.
47. " *ilicis*—Ulmus.
48. " *acaciæ*—Prunus spinosa.
49. " *pruni*—Prunus spinosa, Amygdalus communis, Rhamnus cathartica.
50. " *rubi*—Prunus spinosa, Rhamnus, Cytisus, Hedysarum onobrychis, Amygdalus persica, Rubus, Genista, Ledum palustre.
51. *Lycæna bœtica*—Spartium, Colutea, Phaca bœtica.
52. " *telicanus*—Lythrum salicaria.
53. " *argiades*—Lotus corniculatus, Anthyllis vulneraria, Medicago falcata, M. lupulina, Trifolium arvense, T. pratense, Pisum sativum.
54. " *argyrotoxus*—Genista, Colutea arborescens, Trifolium.
55. " *argus*—Rhamnus, Trifolium montanum, Mellilotus officinalis, Genista germanica, Spartium scoparium, Hedysarum onobrychis, Lotus corniculatus, Erica vulgaris.
56. " *optilete*—Vaccinium oxycoccos.
57. " *orion*—Sedum telephium.
58. " *astrarche*—Erodium cicutarium, Geranium dissectum, G. pusillum.
59. " *icarus*—Trifolium, Mellilotus, Genista, Ononis spinosa, Astragalus glyciphyllos, Fragaria vesca, Medicago.

60. *Lycæna bellargus*—Trifolium, Coronilla varia, C. montana, Hippocrepis comosa, Genista sagittalis, Stachys.
61. " *coridon*—Vicia, Astragalus, Coronilla varia.
62. " *hylas*—Trifolium, Mellilotus officinalis.
63. " *dolus*—Trifolium.
64. " *damon*—Hedysarum onobrychis.
65. " *argiolus*—Rhamnus frangula, Mespilus, Pyrus malus.
66. " *minima*—Anthyllis vulneraria.
67. " *semiargus*—Mellilotus.
68. " *cyllarus*—Astragalus glyciphyllos, Trifolium, Mellilotus, Genista sagittalis, G. germanica, Hedysarum onobrychis.
69. " *jolas*—Colutea arborescens.
70. *Polyommatus virgaureæ*—Solidago virgaureæ, Rumex acutus, R. acetosa.
71. " *dispar*—Rumex, Polygonum.
72. " *hippothoe*—Rumex acetosa.
73. " *alciphron*—Rumex acetosa.
74. " *dorilis*—Rumex acetosa, R. acetosella.
75. " *phlæas*—Rumex acetosa.
76. " *amphidamas*—Rumex acetosa, Polygonum bistorta, Viola canina.
77. *Rhodocera rhamni*—Rhamnus cathartica, Frangula, Mespilus germanica, Pyrus.
78. " *cleopatra*—Rhamnus alpinus.
79. *Colias palæno*—Hydrocotyle vulgaris, Vaccinum uliginosum.
80. " *hyale*—Coronilla varia, Trifolium, Vicia.
81. " *myrmidone*—Cytisus biflorus, C. nigricans.
82. " *edusa*—Onobrychis, Cytisus.
83. *Pieris brassicæ*—Brassica, Rhaphanus sativus, Cochlearia armoracia, Sinapis, Lepidium sativum, Tropæolum, Cheiranthus annuus.
84. " *rapæ*—the same plants as the preceding, and also Reseda.
85. " *napi*—Brassica oleracea, B. napus, Reseda lutea, R. luteola, R. odorata, Turritis glabra, Alliaria officinalis, Sinapis.
86. " *daplidice*—Reseda lutea, Turritis glabra, Erucastrum, Rhaphanus rhaphanistrum, Sisymbrium sophia, Capsella bursa-pastoris, Alyssum incanum, Sinapis, Thlaspi.

87. *Aporia cratægi*—Cratægus oxyacantha, Prunus spinosa, P. domestica, P. padus, Pyrus malus, P. communis, Mespilus, Sorbus.
88. *Anthocaris cardamines*—Alliaria officinalis, Cardamine impatiens, Turritis glabra, Brassica campestris, Hesperis, Sinapis, Thlaspi.
89. *Leucophasia sinapis*—Lotus corniculatus, Lathyrus pratensis, Trifolium pratense (Sinapis is not given).
90. *Parnassius apollo*—Sedum album, Telephium, Sempervivum tectorum.
91. " *mnemosyne*—Corydalis bulbosa, C. solida.
92. *Papilio sinon*—Prunus spinosa, P. domestica, Pyrus malus, P. communis, Amygdalus persica, A. communis, Quercus.
93. " *machaon*—Carum carui, Anethum foeniculum, Apium graveolens, Daucus carota, Pimpinella saxifraga, Angelica sylvestris, Peucedanum chabrei, Heracleum, Oreosilinum.
94. *Nisoniades tages*—Iberis pinnati, Eryngium campestre, Lotus corniculatus, Coronilla varia.
95. *Spilothyrus alceæ*—Malva.
96. *Syrichtus alveus*—Polygala chamæbuxus.
97. " *malvæ*—Malva moschata, Plantago lanceolata, Fragaria, Comarum, Rubus.
98. " *sao*—Rubus idæus.
99. *Carterocephalus palæmon*—Plantago.
100. *Hesperia sylvanus*—Plantago major, Althea rosea, Malva moschata, Lavatera communis.
101. " *comma*—Coronilla varia.

NOTES ON COLLECTING CATOCALAS.

BY ROBERT BUNKER, ROCHESTER, N. Y.

In many respects the Catocalas are among the most interesting of the moths. The contrast of color between their fore and hind wings renders them objects of great beauty, and hence these fair forms of the woods

are eagerly sought after by collectors. My spare time this season was spent in collecting Catocalas. In this part of the country they may be found from the first of June till the first of November. *Amasia* and *ultronia* are seen first; I took a fine *amasia* on the 29th of May, and an *ultronia* on the 10th of June. *Cara* and several other species may be found as late as the first of November.

Oak woods, where the trees are young and sufficiently scattered to admit the sunlight, are the most favorable places for collecting. In a small piece of woods of not more than four acres, I captured thirty-two specimens, among which were thirteen different species. I was unable to visit the place more than eight times; probably many more could have been taken had my visits been more frequent. My collecting was done in this manner: On approaching a tree I examined the trunk carefully up as high as the first limbs; if a Catocala was seen, and low enough down to reach, I used a paper box (collar box) to secure the prize, but if high up the net was brought into requisition. If I failed to find one, I gave the tree a vigorous shake, and if one was lurking anywhere about the trunk it was sure to start up and fly, generally but a short distance, when it would settle, and by cautiously approaching the tree I found no difficulty in securing it. Sometimes two would start up from one tree, generally male and female, and in such a case it was no easy matter to follow both of them; still I generally managed to secure them. As I examined trees I marked them with chalk to save the trouble of working the ground twice over.

Catocalas, like the lappet moths, usually alight on objects that harmonize with their own colors. Those with light grey fore wings were found on white oak *(Quercus alba)*, and those with dark wings, like *epione* and *cara*, on black oak *(Quercus nigra)*.

In a late number of the ENTOMOLOGIST, Mr. Grote gave us a list of the Catocalas, fifty-nine in number; he now adds four new ones to the list. My impression is that additional species will be found in the northern and middle States.

ON SOME OF OUR COMMON INSECTS.

12. *THE AMERICAN COPPER UNDERWING—*

Amphipyra pyramidoides, Guen.

BY THE EDITOR.

This insect is a troublesome one in many parts of our province, and is yearly increasing. It first attracted attention by its depredations on the foliage of the vine, but now, with us, while it is still a plague in the vinery, it is more abundant on plum and apple trees, and is also common on the thorn. It has been known in popular language as "the pyramidal grape vine worm" on account of the larva having a pyramidal hump near the end of its body; also as "the green grape vine worm," in consequence of the larva being of a green colour, but since it is not by any means restricted to the grape, we prefer the common name placed at the head of this article—"the American copper underwing"—given to it because the hind wings of the moth are of a lustrous copper colour. A very similar moth, *Amphipyra pyramidea*, Linn., is common in Europe, the larva of which feeds on the oak, elm, poplar and other trees, and since this insect is known in England as "the copper underwing," we think the common name we have referred to, which was first suggested by Mr. Riley, is a very appropriate one for our species.

Fig. 3.

The larva, of which a very good representation is given in figure 3, first attracts notice early in June, when it may be found about half grown and feeding vigorously; by the middle of the month it has usually attained its full size, when it measures from one and a quarter to one and a half inches in length. The head is rather small, flattened in front, and of a whitish green color, with the mandibles tipped with black. The body is of a delicate whitish green, a little darker on the sides, with a white stripe down the back, a little broken between the segments and somewhat widened behind. On each side, close to the under surface, there is a

bright yellow stripe which is most distinct on the hinder segments, and a second one of the same color, but fainter, half way between this and the dorsal line; this latter is more distinct on the posterior portion of the body, where it follows the peculiar pyramidal hump or prominence on the twelfth segment, as shown in the figure. The under surface of the body is pale green.

When full grown this caterpillar descends to the ground, and, drawing together some loose fallen leaves or other rubbish, spins within a loose silken cocoon, where in due time it changes to a dark, shining brown chrysalis, from which the moth usually escapes in the latter part of July; those which we have reared have appeared about the 20th of the month.

The moth, see figure 4, measures, when its wings are expanded, about one and three quarter inches. The fore wings are dark brown, shaded with paler brown, and with dots and wavy lines of a glossy grey or dull whitish hue. The hind wings are reddish with more or less of a coppery lustre; browner on the outer angle of the front edge of the wing, and paler towards the hinder and inner angle.—The body is dark brown with the hinder portion banded with lines of a paler shade. The under surface of the wings is much lighter in color than the upper.

Fig. 4.

In what stage of its existence this insect passes the winter months has not yet been determined. Whether the eggs, which are probably laid during August, remain dormant during the remainder of the summer and hatch early the following spring, or whether the eggs hatch into larvæ early in the fall, and the larvæ, while still young, become torpid and sleep through the long winter months, remains undecided; we incline, however, to the latter view.

Where the caterpillars prove troublesome their numbers may be lessened by jarring the trees or vines on which they are feeding with the hand, when they will usually drop to the ground, where, on account of their green color, they can be readily seen and destroyed.

ON ANISOPTERYX VERNATA AND POMETARIA.

BY H. K. MORRISON, CAMBRIDGE, MASS.

There has been some confusion lately in regard to the limits and synonymy of these two common species, partially due to Dr. Harris' unsatisfactory reference to them in his "Report on the Insects of Massachusetts," 1841, and to the inaccessibility of Prof. Peck's original description of *A. vernata.*

In the numerous notes on these species and references to them in recent publications, they are in nearly all cases confounded together or wrongly determined; and I have not found them correctly named in a single collection which I have examined.

I reprint the descriptive portion of Prof. Peck's excellent essay. He was only acquainted with *vernata* and makes no reference to any other species. Dr. Harris considered *pometaria* the true "canker worm," and *vernata* a variety; on what grounds I do not know, as the latter is much the commoner, and, I presume, the most destructive. The following description of *vernata* was published in the Massachusetts *Magazine*, vol. vii, Sept. and Oct., 1795, and reprinted in 1827 in the New England *Farmer*, vol. v.:

"*Phalaena vernata, geometra geticornis, alis cinereis, fascii tribus obscuris, fuscis, posticis immaculatis, femina aptera.* The wings are ash color "with three obscure blackish transverse stripes, and a small dash of the "same color at the tip; the under wings are of a uniform color and "rather lighter than the ground color of the upper ones. The body of "the female is nearly four lines in length, ash colored and marked on the "back with a brown list extending from the thorax to the tail. In thirteen "days the females deposit their eggs; these are placed in the crannies of "the bark in the forks of small branches, and where there are spots of "moss upon the smaller limbs; they seem most fond of insinuating "themselves in the cavities between its leaves. For this purpose they "are furnished with a tube through which the egg is passed. The egg is "elliptic, one-thirtieth of an inch in length, of a pearl color with a "yellowish cast. The larvæ when full grown are about 9 lines long. The "head pale, marked on each side with two transverse blackish stripes, the

"back ash colored, marked lengthwise with small interrupted dusky lines. "The sides blackish, with a pale line along the length of the body; there "are two white spots on the last segment of the body. The abdomen "beneath is ash colored. The chrysalis is about five lines long and one "and one-half lines in diameter, of a light hazel color, oblong and "pointed at one end. Their natural and regular time of rising is about "the middle of March, but happens earlier or later according to the "warmth or coldness of the season."

Dr. Harris described the male of what he considered the true "canker worm moth" as follows. The female he seems to have confounded with the females of *vernata*.

"The fore wings are ash colored, with a distinct whitish spot on the "front edge near the tip; these are crossed by two whitish, jagged bands "along the sides of which there are several blackish dots; the outermost "band has an angle near the front edge, within which there is a short, "faint, blackish line, and there is a row of black dots along the outer "margin close to the fringe. The hind wings are pale ash colored, with "a faint blackish dot near the middle. The wings expand about one "inch and a quarter. This species may be called *Anisopteryx pome-"taria*."

It has been thought that perhaps these two forms were the autumnal and vernal broods of the same species.

That the two species are entirely distinct, differing from one another in the most positive and unmistakable characters, has been abundantly shown by Mr. B. Mann in the Proceedings of the Boston Society of Natural History.

I give below the distinctive characters of the two species arranged in the most convenient form for comparison. It will be noticed that while the species resemble each other closely externally, the differences, particularly in the females, are in many cases structural.

Vernata, Peck.	*Pometaria*, Harr.
The first seven rings of the abdomen in both sexes bear each upon the back two transverse rows of stiff red spines, pointing towards the end of the body.	The first seven rings of the abdomen in both sexes with no spines upon the back.

Fore wings of male ash colored or brownish gray, the whitish spot found on the fore wings of *pometaria* wanting.

Fore wings of male ash colored, with a distinct whitish spot on the front edge near the tip.

The whitish bands found on the fore wings of *pometaria* are wanting, but there is a jagged, submarginal white band on the upper side of the fore wings in most specimens.

Forewings crossed by two whitish jagged bands ; the outermost band has an angle near the front edge ; the whitish bands are sometimes obsolete, in which case only the whitish spot remains.

Three interrupted dusky lines across the fore wings, instead of two lines as in *pometaria ;* sometimes these lines are only indicated by dark spots on the costa and by blackish dashes at the crossing of the median nervure.

Along the sides of the whitish bands there are several blackish dots, each on a nervule, and all generally connected together by a dusky band which includes them.

There is an oblique black dash near the tip of the fore wings, also a distinct, nearly uniform, continuous black line before the fringe.

Within the angle of the outermost whitish band, near the front edge, there is a short, faint, blackish line, and there is a marginal row of black dots before the fringe.

The white band found on the hind wings of *pometaria* is wanting.

In most specimens a curved white discal band extending across the hind wings.

Abdomen of the female terminating in a retractile ovipositor rather acutely tapering behind.

Abdomen of the female without ovipositor, terminating bluntly.

Body and legs of the female clothed with whitish and dark brown dentate scales ; general coloration not uniform ; a black, dorsal, longitudinal, interrupted band on the abdomen ; a whitish patch on each side of the beginning of the band ; the spines often give a reddish tinge to the part they occupy.

Body and legs of the female smooth, clothed with glistening brown and white truncate scales intermixed, giving the body the appearance of uniform shining, dark ash color above, and gray beneath.

In regard to the time of appearance of the species, *vernata* emerges in the spring (March and April). I have never seen a specimen taken in the autumn. It is by far the commoner of the two. *Pometaria* is not so common as *vernata*, and the great majority of specimens emerge in the fall or early winter, very rarely a few remaining over until the spring. The spring specimens of the male are very strongly marked, of a dark smoky brown, resembling somewhat in coloration the dark suffused variety of *Cleora pulchiaria*, Minot. Although I have searched particularly for them, I have never been able to take but two males. The females seem to be more common in the spring, and do not differ from the fall specimens.

I have examined 150 male, 70 female *vernata;* 40 male, 60 female *pometaria*, taken in the autumn, and 2 male, 10 female *pometaria*, taken in the spring.

NOTES ON THE LARVA OF BOARMIA LARVARIA, GUENEE.

BY THE EDITOR.

Several of the larvæ of this species were taken on the 24th of June; they were found feeding on willow and taken by beating the bushes over an umbrella.

Length one inch; body cylindrical.

Head medium-sized, flat, bilobed; brownish grey in front, a little darker at the sides, with a patch of brownish black on the summit of each lobe, and a few short brownish hairs; mandibles brownish black.

Body above reddish brown, smooth and glossy, having here and there a greenish tint, and with many fine longitudinal lines of a slightly darker shade scarcely visible without a lens. On each segment, from fifth to twelfth inclusive, there are two small black dots on each side of the dorsal line, and on sixth segment a black tubercle with a small patch of white at its base in front. On seventh, eighth, ninth, tenth and eleventh segments are similar black tubercles, but much smaller, with a whitish dot on the anterior part of the base of each, most distinct on tenth and eleventh

segments. Twelfth segment with two scarcely raised black tubercles above, a short black streak on each side behind them, and a small whitish spot in front; terminal segment with a few very fine short brownish hairs. Spiracles small sub-oval, pale ringed with black.

Under surface similar to the upper, with the greenish tint a little more decided and a central stripe of greenish white widening between the two pairs of prolegs; each segment from fifth to ninth has several small black dots. Feet yellowish green, faintly ringed with black at their base; prolegs green, marked with reddish brown on the outside.

Two specimens entered the chrysalis state on the 25th of June; one produced the imago on the 9th of July, the other on the 12th. The moth was kindly determined for me by Dr. A. S. Packard, Salem, Mass.

A DISSERTATION ON NORTHERN BUTTERFLIES.

BY WILLIAM COUPER, MONTREAL.

The Swallow-tail Butterflies which occur on the Islands of Anticosti and Newfoundland, and on the north coast of the Gulf of St. Lawrence are at present a subject of dispute, both as to species and position among the Papilionidæ. Having some knowledge of their localities and geographical range, I venture to state my opinion on the matter.

When I first visited the south coast of Labrador, in 1867, a Swallow-tail butterfly was taken by me at Natashquan, where it was rare. I supposed it then to be a boreal variety or race of *Asterias*, and on my return to Quebec presented two or three specimens to the Rev. Mr. Innes, who had a collection of Lepidoptera among which were specimens of a smaller *Papilio*, which he informed me came from St. John's Newfoundland. Mr. Innes removed afterwards to London, Ont., and I heard no more of the Labrador or Newfoundland *Papilios* until Mr. W. Saunders described his *Papilio brevicauda* in "Packard's Guide." Mr. Saunders obtained his specimen through the kindness of Mr. Innes, who told him that he had received it from an officer who had been spending some time at St. John's. If the *Papilios* taken by me at Natashquan, Labrador were in Mr. Innes' cabinet when Mr. S. obtained the specimen described as *brevicauda*, did Mr. Innes point them out to Mr. S. in order to compare with those from Newfoundland? This primary question should be answered, because there is no evident difference between the *Papilio* of

Anticosti and that of the Labrador coast.* Yet Mr. Saunders states (April 30th, 1873) "that he saw one of my Anticosti specimens at Mr. "Mead's, in New York, but did not feel at all satisfied that it was identi- "cal with his *brevicauda*. *Polyxenes* is Scudder's new name for *asterias*, "but he (Scudder) does not regard *brevicauda* now as identical with it."

I have tried to obtain a specimen of the Newfoundland *Papilio*, and communicated with a gentleman residing at St. John's, Newfoundland, asking him to procure specimens of this swallow-tail butterfly for me. He says: "In my opinion it is very rare in this district. During the last "three summers I have seen but one specimen, and some of my "friends here confirm the opinion regarding its rarity." That he has reason to believe that in other parts of the Island it is more abundant, as he has heard of it at Cod Roy, on the western coast, and Notre Dame Bay, in the north of the Island. He adds "that a Halifax "Entomologist has been enquiring for it on the south coast of the Island "for some time, without success."

I am confident that it becomes scarce as we proceed down the south coast of Labrador, towards the Straits of Belle Isle. The true *habitat* of the *Papilio* (specimens of which I gave Rev. Mr. Innes in 1867) is the Island of Anticosti, where it occurs more abundantly than in Labrador or Newfoundland. It is met with occasionally at Mingan, but more commonly at the mouths of rivers east of Seven Islands.

The description in "Packard's Guide" does not exactly correspond with the external markings of the Anticosti specimens, and I candidly state that I have never seen a butterfly whose general features are more uniform than in that of the latter Island.

Mr. Edwards, of W. Virginia, states that it is not related to *asterias*, but to *machaon* and *zolicaon*. In a letter from him, dated August, 1873, he thinks that the Anticosti *Papilio* is undoubtedly *brevicauda*, Saunders, whose description was taken from a single ♀, and the fulvous prevailed remarkably in the yellow spots. That the description of *brevicauda* fits one of the Anticosti ♀ exactly. He points out, however, wherein the Anticosti *Papilio* differs notably in two respects from *machaon*, or the American representative of that, viz., *P. Aliaska*, Scudder, and from *zolicaon*. 1st—the hind wings are black, while in the others from base to

* The specimen Mr. Innes gave me was from Newfoundland. He did not show me Mr. Couper's specimens.—Ed. C. E.

disc they are yellow. 2nd—the abdomen of the Anticosti species is spotted with yellow like *asterias*, while all the others have that part black with yellow lines, as in *turnus*. In a letter from Mr. Edwards, dated Sept. 1st, 1873, he says that "we had all been looking for affinity to *asterias*, while the butterfly belonged to another group. Strecker described it as a var. of *asterias*, and so Packard considered *brevicauda* a var. of *asterias*. In my synopsis I put the species down as a var. of *asterias*. It is many years since I saw the original *brevicauda*, and I have forgotten its appearance; but in reading over the description in Packard, I consider that the excess of fulvous is the only permanent distinction between the Newfoundland and Anticosti specimens." Mr. Grote agrees with Mr. Edwards that the *Papilio* collected in Anticosti is *brevicauda*, Saunders, but I think my memory serves me correctly when I state that the specimens of *Papilio* in Mr. Innes' collection from Newfoundland were considered distinct by the latter gentleman and myself, at that time. The Newfoundland specimens were smaller than those from Labrador; indeed, we looked on the St. John's butterfly as dwarfed, but the species was not then determined.

Not having access to all the forms constituting connecting groups of *Papilios*, I am not prepared to concur with the gentlemen who have classed it with *machaon* or *zolicaon*. At first view the Anticosti butterfly takes the characters of *asterioides*, Reakirt, and *asterias*, while the form has a mere approach to *machaon* and *zolicaon*. I suppose it is on account of the latter affinity that Mr. Edwards places it near *machaon* and *zolicaon*, but there are these notable differences between the Anticosti *Papilio* and *P. Aliaska*, Scudder, or *zolicaon*, viz., 1st, the hind wings are black and the *interior band* underneath is constant in form and number of spots, and the spots are not wedged into each other as in *zolicaon* or *asterias*. 2nd, the abdomen is spotted with yellow similar to *asterias* and *asterioides*, and in fact, in my judgment, the Anticosti *Papilio*, with the exception of the width of the macular band, is a prototype of *asterioides*, Reakirt, from Mexico. Constancy of marks on the wings and body of an insect, no matter to what order it belongs, is undoubtedly *bona fide* evidence of the stability of the species.

We have evidence of European insects introduced into this country becoming acclimatized and segregated in course of years, and a few of these which we now find holding a local existence on such islands as Anticosti and Newfoundland, may have in earlier times found it necessary

to search for more congenial localities, there becoming attached to new food plants, which, no doubt, have an influence in diversity of colors. We have an instance of this in the American representative of *Vanessa antiopa*, which is of rare occurrence in Anticosti; but where it retains the features of its English congener, while those taken in more southern latitudes assume a different coloration. Instance also the introduction of *Pieris rapæ* into Canada of late years. This species has now a struggle to exist in the latitude of Quebec, but so long as its food plant is abundant it will continue with us. It has been gradually moving south, where, with a more favorable climate, it propagates extensively. This butterfly also shows the effects of climate in the appearance of a yellow variety. It may be possible that the butterflies called *brevicauda* by Mr. Saunders and *Anticostiensis* by Mr. H. Strecker, had a similar origin. The connecting link or affinity of *Papilio brevicauda* with *asterias* is only a perplexing attempt to make the Anticosti form an ally of the continental *P. polyxenes*, which is Scudder's new name for *asterias*.

I cannot find sufficient reason for such connection, as there is quite a distinction between the larva of *asterias* and that of the Anticosti butterfly. It may, however, be discovered that an affinity occurs in *P. asterioides* and *brevicauda* or *Anticostiensis;* and although the former is found in Mexico, I see no reason to doubt their connection in years gone by.*

Considering the present rate of travel of *Pieris rapae* southwardly, it may during the course of another twelve years reach Costa Rica, and there change so much externally as to be claimed as another variety, while the Canadian form will still be called the segregated species. Mr. Hermann Strecker, of Reading, Penn., in his "Rhap. et Hetero." No. 6, page 48, gives the geographical distribution of *asterias* as follows:—"The "ordinary form, with but little variation, occurs from Canada to Florida," taking a southern range, while it extends west as far as Colorado. He considers *asterioides* to be the tropical form of *asterias*, that *brevicauda*

* NOTE.—"The insects of separate arctic regions have a great mutual resem-"blance, and the difference between them increases in the successive concentric "circles from the above regions towards the equator. It has been said that the "advance of the glacial period was accompanied by the migration of insects "southwards, and that the present distribution of insects was effected by the pre-"valence of this epoch, and by the succeeding temperate epoch."—*F. Walker, F. L. S., in Can. Ent., vol. iii, p. 148.*

may be a segregated type peculiar to Newfoundland, while the species which he has named *P. Anticostiensis* is considered to be a sub-arctic form, peculiar to the Island of Anticosti and south coast of Labrador.

Messrs. Edwards and Strecker have given me considerable aid in forming the opinions which I now advance, and although the former states that the Anticosti *Papilio* is not related to *asterias* (as a group), the question of greatest import is as to whether it is connected with *asterias* and *asterioides* specifically.

Should the Newfoundland, Labrador and Anticosti *Papilios* turn out to be identical, I should hold that they are the segregated and original type, existing in their primitive concentric circle, and that the variations of *asterias*, which are now being discovered throughout the great extent of territory south and west of Labrador, are descended from the northern form, and that these varieties have changed by food and climatic influences. The northern *Papilio*, although differing in size, never varies in its coloration, and this peculiar feature of constancy constitutes the principal ground of my opinion. It may be discovered that the Newfoundland *Papilio* is different in some respects from those occurring in Labrador aud Anticosti, but the proof that such is the case is not thus far sufficient to disturb the theory advanced, that one is a race of the other.

(To be Continued.)

CORRESPONDENCE.

PARASITES.—I collected two dozen chrysalids of *Pieris rapae* about the second week in January. They were taken indiscriminately from under the coping of a wooden fence in this city. All these chrysalids were filled with the larvæ of a small parasite, probably *Pteromalus puparum*. I have counted ninety-five in one chrysalis. It occurs to me that chrysalids containing these parasites could be sent to a great distance during winter, and it would be interesting to learn their progress in localities where *rapae* does not occur. I am certain that Montreal can supply them in any number. Mr. Caulfield informs me that another small parasite came from a chrysalis of *Grapta progne*.—WM. COUPER, 67 Bonaventure Street, Montreal.

DEAR SIR,—

On the 23rd and 24th of last July I caught 2 specimens of *C. philodice* ♀, of a white color, with a slight greenish shade, especially towards the inner margin of the hind wings. As these are the only times that I have happened to meet with this variety, I would like to know whether it is common or not.

About the end of July or the beginning of August last, I caught a very battered butterfly which closely resembles *L. ephestion*, Stoll., except that it has a row of white spots crossing the front wings and following very much the same direction as the outer edge of the white band of *L. arthemis*. The white spots are better defined on the under than on the upper side. The orange spots also on the front wings are very small and indistinct. Is this a distinct species or only a variety of *L. ephestion*?

Last year there was a second brood of *L. ephestion* at Portland, which appeared about the end of August. I believe that this is the first time within the last six years that this has occurred there. There appeared also, about the same time, a pretty plentiful supply of *G. comma*. These I constantly found alighted on the warm, sandy road, which they appeared to prefer to all floral attractions.

Within the last four or five years I have not been able to obtain a single specimen of *C. cardui* in the vicinity of Portland, though formerly they were quite common.

C. atalanta has also greatly decreased in numbers within the last two or three years. In 1872, out of 20 or 30 caterpillars which I tried to rear, only one arrived at maturity, most all the rest being infested with parasites.

Yours, &c.,
H. H. L., Montreal.

ANNUAL MEETING OF THE LONDON BRANCH.

The annual meeting of the London Branch of the Entomological Society of Ontario was held at the residence of Mr. W. Saunders, on the 17th of February.

A goodly number of members were present, and the following officers were elected for 1874: President, A. Puddicombe; Vice-President, H. P. Bock; Secretary-Treasurer, J. G. Geddes; Curator, J. Williams; Auditors, Messrs. C. Chapman and J. Griffiths.

A box of Lepidoptera from Miss Carey, of Amherstburg, was shown by Mr. E. B. Reed, containing some interesting specimens taken in that locality; among others there were fine examples of *Papilio thoas* and *Philampelus satellitia.*

W. Saunders exhibited a box of Coleoptera, embracing a large number of species kindly donated by Theodore L. Mead, Esq., of New York. Also, several boxes of European insects, presented by Francis Walker, Esq., of the British Museum. The Secretary was instructed to tender to Mr. Walker the sincere thanks of the Society for his continued liberality in this matter—the cabinets of the Society and those of the members also having been repeatedly enriched with valuable specimens through his kindness.

OBITUARY.

Dr. LeConte announced the death, at Davidsburg, York Co., Pa., on the 10th March, of Friedrich Ernest Melsheimer, M. D., a correspondent of the Academy, aged nearly ninety-one years. He inherited great taste for entomology from his father, F. F. Melsheimer, a clergyman, who cultivated natural science with much success, and not only was a highly esteemed correspondent of Knoch and other European entomologists of the end of the past and beginning of the present century, but an active collaborator with Say, the founder of descriptive entomology in the United States.

Dr. Melsheimer thus inheriting the tastes and the collection of his father, has preserved, for later investigators, the only authentic types of many of Mr. Say's species; and has also contributed no small proportion of the descriptions of Coleoptera, which appeared up to February, 1847. His memoirs on this subject, containing notes and descriptions of about four hundred and fifty-seven species, were printed in the 2d and 3d vols. of the proceedings of this Academy.

Entomology also owes to him the catalogue of the described Coleoptera of the United States, which, after revision by Prof. S. S. Haldeman and myself, was published by the Smithsonian Institution in 1853. It was the first work of bibliographical importance in the modern history of that branch of science, and gave a powerful impetus to its developement in the United States, and has greatly diminished the labor of those who have continued the study of that department.

Living an isolated life on his farm, remote from usual lines of travel, dependent almost entirely on letters for the sympathy and counsel of his fellow students, separated from libraries containing the results of modern research, and therefore dependent on the traditional knowledge received from Europe, which constituted in fact most of the intellectual capital of the founders of natural history in the United States, Dr. Melsheimer must be considered as a very remarkable instance of one who, with very limited opportunities, has worked honestly, to the extent of his abilities, to develop the powers of usefulness which were given him.

Modest, unpretending, affectionate to his family, devoted to his friends, industrious to the limit of human usefulness, his death, at such an advanced age, can only leave, with those who have enjoyed his acquaintance, a satisfaction that they have known so good a representative of the purer qualities of humanity.—*Proc. Acad. Nat. Sci., Phil.*

BOOKS RECEIVED.

First, second and third Annual Reports of the United States Geological Survey of the Territories for 1867, 1868 and 1869, 8vo., pp. 86. From F. V. Hayden, U. S. Geologist.

Sixth Annual Report of the United States Geological Survey of the Territories, embracing portions of Montana, Wyoming and Utah, for the year 1872, By F. V. Hayden, U.S. Geologist, 8vo., pp. 844, with numerous illustrations.

Contributions to the Extinct Vertebrate Fauna of the Western Territores. By Joseph Leidy, from the U. S. Geological Survey, Washington, D. C

Acrididæ of North America. By Cyrus Thomas, Ph. D., from the U. S. Geological Survey, Washington, D. C.

Catalogue de Livres D'Histoire Naturelle. De E. Deyrolle Fils 23, Rue de la Monnaie, Paris.

The Scottish Naturalist, January, 1874.

Science Gossip, January, 1874.

Nature, to January 22, 1874.

Canada Farmer, to Feb. 2, 1874.

Indiana Farmer, Jan., 1874.

Contributions to Entomological Bibliography, up to 1862. By Albert Muller. No. 3.

Newman's Entomologist, Nov. and Dec., 1873; Jan,, 1874.

The Zoologist, Dec., 1873., and Jan., 1874.

The Entomologists' Monthly Magazine, Dec., 1873.

The Horticulturist, Jan.. 1874.

Annals of the Lyceum of Natural History of New York, Nos. 6, 7, 8 and 9, to Feb., 1873.

Hints for the Promotion of Economic Entomology in the U. S. By John L. LeConte, M. D.

American Agriculturist, Feb., 1874.

Monthly Report of the Department of Agriculture, Jan. 1874:

Le Naturaliste Canadien, Janvier. 1874,

The Western Rural, Chicago, to Jan. 24, 1874.

Rural New Yorker, Jan., 1874.

Maine Farmer, Dec. 29, 1873.

The Canadian Entomologist.

VOL. VI. LONDON, ONT., MARCH, 1874. No. 3

DESCRIPTION AND HABITS OF A SUPPOSED NEW SPECIES OF LEPIDOPTEROUS LARVA OF THE GENUS SPHINX.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

Des.—Body cylindrical, tapering gradually anteriorly, 12-jointed, exclusive of head. Head sub-elliptical, thickly punctured, moderately pubescent and of a yellowish brown color. Oral appendages largely developed. Antennæ 3-jointed, cylindrical, acuminate, the basal joint very long and quite thick. A dark purplish curved band passes from the crown of the head to the right antenna. Prothoracic segment surmounted by a transversely elongated, punctated, corneous saddle, concolorous with the head.

General color dark purple, relieved by two series of dorso-lateral gold-colored dots, ranging from the posterior half of the metathoracic to the seventh abdominal segment (each series containing twenty-seven points). The anterior half of the second, to the seventh abdominal segments inclusive, each furnished with a single, much larger, similarly colored one. Above the line of the prolegs, intermediate between this and that of the spiracles, on each side, is a row of irregularly shaped yellow spots.

True legs moderately elongate, acuminate, 3-jointed and yellowish brown in hue, the tarsal joint being armed with a short, recurved, black claw: the whole slightly invested with short black hairs. The membraneous legs of the 3rd, 4th, 5th and 6th abdominal segments cylindrical, thickish, abruptly truncate at base, and clothed with short reddish brown hairs, and armed on the inferior aspect interiorly with a double row of stiff, ferruginous hairs, for adhering to objects. Anal pro-

leg sub-quadrangular, warty and pubescent, and surmounted by a triangular supra-anal plate of a dark purplish color, with the apex directed posteriorly.

Prothoracic and first and abdominal rings are furnished each with a pair of transversely oval, yellowish spiracles. Inferior aspect of the larva is marked with clusters of white spots, relieving the monotony of the purple. Last abdominal segment surmounted by a moderately long recurved horn, yellowish brown in color, and bearing scattered gland like bodies, which manifest a tendency to become spines. Length nearly 3 inches. Taken in Germantown during the first week of September, while feeding upon the leaves of *Polygonum pennsylvanicum*.

This larva, belonging, as it does, to the family Sphingidæ, is undoubtedly rare, as it is the only one that I have met with in all my entomological rambles; nor can I find in any of the works at my command a description, still less a figure thereof. In some respects it resembles the full-grown larva of *Sphinx euphorbia*, described and figured in "Transformation of Insects," by Dr. Duncan; in others it differs very materially therefrom. In the Euphorbia Sphinx the yellow points are scattered promiscuously over the dorsal and lateral surfaces of the body, but in the specimen under consideration they are arranged with some view to order. There is a still further resemblance in the irregular spots which flank the sides, just beneath the line of stigmata, and in the general color, the former being black, and the latter a rich dark purple. It differs from the former in being devoid of the three longitudinal lines of carmine tint, which is a prominent feature of it, and also in being more tapering anteriorly.

There is one character in the life history of this larva which struck me as peculiarly novel and interesting, and which deserves to be placed upon record. Instead of assuming the peculiar Sphinx-like attitude in a state of rest, (whence the popular name of Sphinx is derived), and which is so familiar to entomological students as well as the outside world, it curves its body, bringing the head and tail in close proximity, reminding one of the position which is so easily and readily taken by the larva of *Cimbex ulmi*, Reek.

It cannot be denied that this is its natural posture in a state of inaction. To assure myself that a position which seemed so natural and easy to the worm was not an occasional one, I was permitted in the

intervals of relaxation and freedom from duty, to give it prolonged and careful attention for many consecutive days. In not a single instance did it assume the attitude so eminently characteristic of the Sphinx family.

One other peculiar trait of its nature it was my happy fortune to observe. Caterpillars, as is well known, have a variety of ways for defending themselves against the annoyances and assaults of their enemies. While some are provided with hairs which act as irritating causes when brought into contact with highly sensitive surfaces, others are furnished with fearful looking spines which infuse a feeling of horror into their enemies, even when they have not the power to act as irritants. This species, presenting an almost perfectly smooth bodily surface, assuredly makes up from its lack of integumentary appendages, in being armed with a pair of powerful tridentate mandibles, which it uses freely and indiscriminately.

Hundreds of Lepidopterous larvæ have been handled with impunity by the writer, and this new method of self-defence, even where manifested, has been so slight as not to attract much attention. In this case the insect seemed unwilling to permit any familiarities. The softest touch of the finger was sharply resented. On one occasion the writer's finger was seized and held on to with such pertinacity, as to require considerable effort at extrication. The smart from this squeezing lingered for many minutes afterwards—a suitable punishment for his temerity. Even when laid upon the palm of the hand it continued its rapid twitchings from side to side, and with gaping jaws, as if still conscious of hidden danger, ready to vent the full measure of its infuriated passion upon anything that should come within their scope.

In conclusion, I am sorry to say that my *vivarium* having been unduly tampered with during my absence, this caterpillar, which was always exceedingly restless under confinement, effected its escape. On the discovery of the fact dilligent search was commenced, but no clue to its whereabouts could be obtained—it, doubtless, like many of its unfortunate kind, having become a rich morsel for some insect-loving bird. I trust to be able during the gradually approaching season to secure similar larvæ and bring them to the imago or moth condition.

HESPERIA PAWNEE. *N. sp.*

BY G. M. DODGE, GLENCOE, DODGE CO., NEBRASKA.

Male expands 1.45 inches. Primaries above fulvous. Subcostal, submedian and subdorsal veins black at the base. Stigma black and conspicuous, followed by a dusky shade. A small black line at the extremity of the disk is preceded by a yellowish white or semi-transparent spot in the disk; a similar spot, triangular in shape, appears between the first and second median veinlets at their divarication, and two others between the sixth and seventh subcostal veinlets. The outer margin is broadly bordered with brown, which is finely powdered with fulvous scales toward the apex.

Two nearly square fulvous spots between the last subcostal and first median veinlets, separate an oval brown patch that lies at the extremity of the disk, from the border. Costal edge blackish. Fringe white, dusky toward the apex.

Secondaries fulvous, bordered with brown; broadly and darkest along the anterior edge, narrowly on the outer edge, where it appears as cuneiform spots between the veinlets, and broadly again along the inner edge, where it is sprinkled with fulvous. Most of the veins on both wings are black. Underside of both wings pale yellow. Primaries black at base, having a black line corresponding to the stigma.

Inner margin brown, preceded by a large whitish patch. Five pale whitish spots near the apex, another in the disk, and one between the first and second median veinlets. Fringe white at the anal angle, brown tipped with white at the apex. Secondaries have a whitish spot in the disk, and are crossed by a nearly straight row of small whitish spots. Head and thorax greenish yellow. Body black. Abdomen, breast and palpi yellowish white. Antennæ black and yellow above, white tipped with chestnut below.

The spots on the underside of secondaries sometimes obsolete.

♀ light brown above, with a slight purplish reflection. Primaries sprinkled with fulvous scales near the base and inner angle. There is a large, square, white spot in the disk, and an unequal, curved row of nine white spots extend from the costa—beginning about two-tenths of an inch from the apex—to the submedian vein. The first three spots are narrow

and equal, the fourth and fifth are small and square and lie nearest the outer edge of the wing, the sixth is larger and triangular, the seventh largest and square, the eighth and ninth are irregular in shape and partly fulvous.

Secondaries darkest along the anterior margin. A curved row of five whitish yellow spots, of which the second and third are longest, crosses the wing beyond the disk, and in the disk is a small yellow spot. A yellow streak precedes the last median veinlet, running to the outer margin. Fringe of all the wings white. Below, on the primaries, the same white spots appear as above, except that the eighth and ninth are merged in a large whitish patch situated as in the male. A brown patch covers part of the base and inner margin, and extends to the center of the wing. On the secondaries three small white spots appear near the apex. The ground color of both wings is yellowish white, most deeply tinged with fulvous near the costal border of the primaries. Fringes white. Head, thorax and body brown above. Abdomen and palpi white. Antennæ black above, whitish tipped with red below.

This species was taken at Glencoe, Nebraska, upon high rolling prairie, from the first to the middle of September.

The writer can exchange a few males for United States diurnals, with those desirous of seeing the types.

LIST OF NEUROPTERA

COLLECTED BY J. PETTIT, GRIMSBY, ONT.

Psocus striatus,
Pteronarcys biloba?
Calopteryx maculata,
Lestes rectangularis,
" forcipata,
" unguiculata,
Agrion saucium,
" irene,
" ineis,
Aeschna constricta,
Plathemis trimaculata,
Libellula luctuosa,
Libellula 4-maculata,
" pulchella,
" semifasciata,
Diplax intacta,
" rubicundula,
Chauliodes pectinicornis,
" maculatus,
" angusticollis,
Polystoechotes punctatus,
Myrmeleon obsoletus,
Panorpa rufescens.

ON SOME OF OUR COMMON INSECTS.

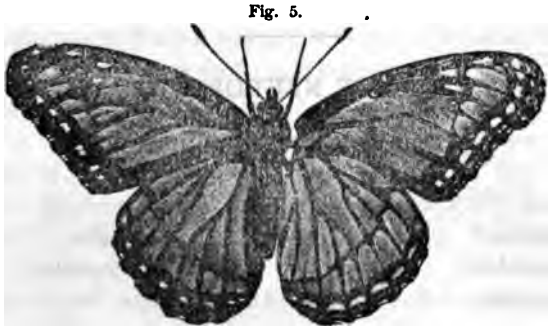
13. *THE DISIPPUS BUTTERFLY—Limenitis disippus*, Godt.

BY THE EDITOR.

In the annual report of the Entomological Society of Ontario, for 1872, this insect is referred to at some length, and from the material there given much of the following has been condensed. In the perfect or winged state it is tolerably common throughout Ontario, and in this condition it very closely resembles our common red or *archippus* butterfly, see CAN. ENT., vol. v, p. 4, from which, however, it may always be distinguished by its smaller size and by a black band which crosses the hind wings, which band is entirely wanting in the *archippus*.

Fig. 5 represents the *disippus* butterfly. The ground color of the wings is a warm orange red, with the veins heavy and black, and the margins spotted with white. In the figure the left wings represent the upper surface, while those of the right, which are slightly detached from the body, show the underside; the two surfaces differ but

Fig. 5.

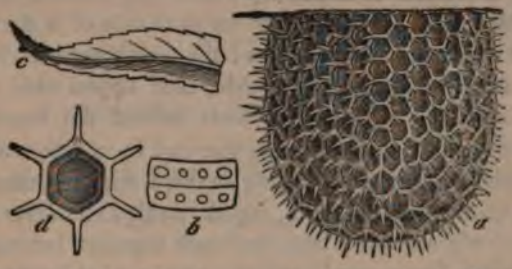


very little in color or markings. The butterfly appears on the wing rather late in the summer, when it may frequently be seen hovering about willow bushes, on which the female usually deposits her eggs, that being the favorite food plant of the larva.

The egg, which is well shown in fig. 6, is a very beautiful object; *a* represents it highly magnified, while at *c* it is shown of the natural size and in its usual position on a willow leaf. At *d* one of the minute cells

of the egg is shown still more highly magnified. Mr. C. V. Riley, who was the first to describe this egg, says that at first it is of a pale yellow color, but that it soon becomes gray as the enclosed larva develops. The

Fig. 6.



eggs are usually deposited singly near the tip of the leaf, generally on the under side, although sometimes on the upper, and occasionally two or even three are placed together.

In a few days the young larva appears. As it issues from the egg it measures only one-tenth of an inch long, has a large yellowish brown head, and a pale yellowish brown body, the latter with darker streaks and a few pale dots and warts, the warts having pale spines or bristles issuing from them. The larva attains full growth in about one month from the time of hatching, when it appears as shown at *a*, fig. 7. It is then about one inch and a quarter long, with a rather large head, which is flattened in front and divided by a central depressed line into two lobes, each of

Fig. 7.

which is tipped with a green tubercle or short horn. The head is of a pale green color, with two dull white lines down the front, and roughened with a number of small green and greenish white tubercles.

The body above is of a deep, rich green color, with patches and streaks of dull white; the second segment is smaller than the head, and thickly covered with whitish tubercles; the third segment, which is dull whitish green, is raised considerably above the second, and has a flat ridge above with a long brownish horn on each side of it thickly covered with very short white and brown spines; the fourth segment has a similar ridge, with a small tubercle on each side, each tipped with a bunch of short whitish spines. All the segments behind the fourth have two tubercles, one on each side, of varying size and in a line with the long horns on the third segment, each being covered with a cluster of whitish spines. The tubercles on seventh, eighth, tenth and eleventh segments have a streak of white at their base, and each segment behind the fourth, excepting the ninth, has several smaller tubercles of a bright blue color. A large whitish patch covers nearly the whole of the ninth and parts of the eighth and tenth segments, and another of a similar character covers the second, third and part of the fourth. A white stripe extends along each side, close to the under surface, from the fifth to the terminal segments, in which is set a small cluster of whitish spines about the middle of each segment, from the sixth to tenth inclusive. On each side of the seventh, eighth and tenth segments is an elongated blackish spot, just above and behind the spiracles; the latter are rather large, oval, and of a brownish black color.

The under side is whitish green, with a central dull white stripe on the hinder segments; the feet are brown, ringed with brownish black; the prolegs pale greenish, faintly tipped with brown.

The chrysalis, fig. 7, *d*, has a curious mixture of colors—brown, grey, flesh color and white—and is characterized by a remarkable, thin and almost circular projection sticking out from the middle of its back, which has been likened to a Roman nose.

There are two broods of this insect during the year; the larvæ of the second brood scarcely attain half their growth when they hybernate, and complete their developement the following spring. On the approach of inclement weather the little caterpillar constructs a curious case in which to dwell, see *c*, fig. 7, which has been likened to the leaf of a miniature pitcher plant; having first, by means of silken cords, firmly secured the stem of the leaf it uses to the twig on which it grows. These cases are frequently found upon willow bushes, and also on the American poplar during the winter season.

This butterfly is subject to the attack of several parasites ; one a tiny dark four-winged fly, infests the eggs ; another four-winged fly of a larger size, and a still larger two-winged fly attack the insect in its caterpillar state.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 11, vol. vi.

ERRATA.—Ante v. 5, p. 229, for *Laruna* read *Laverna*.

DRYOPE, *gen. nov.*

Primaries lanceolate ; the costa enters the margin about the middle discal cell narrow and closed by a nearly straight discal nervure. The subcostal sends off a long curved branch from about its middle, and which attains the margin behind the end of the cell. From the end of the cell the subcostal bends somewhat obliquely upwards to the costal margin. The median is furcate from the end of the cell, both branches being short and bending somewhat suddenly downwards to the dorsal margin, the inner branch being straight and continuous with the discal vein. The discal vein emits five branches, the superior going to the costal margin, the next furcate before the tip with one of the branches to each margin ; the three others go to the dorsal margin.

Secondaries narrowly lanceolate, costal vein short, subcostal very long, simple, attaining the costal margin near the tip ; cell unclosed ; median vein with three nearly equidistant branches. No discal vein but an independent branch which arises near the median and attains the dorsal margin before the apex.

Head smooth ; vertex short and broad ; forehead obtusely rounded ; face smooth, narrow and much retreating ; tongue long, clothed at the base. No maxillary palpi ; labial palpi short, porrected, densely scaled, almost tufted beneath ; no ocelli ; eyes large, but partly concealed by some long scales pendant from the swollen basal joint of the antennæ, which are about two thirds as long as the primaries, with the joints closely set and microscopically pubescent.

This genus must approach closely to *Chauliodus*, Treit., but I can not reconcile either Mr. Stainton's or Dr. Clemens' diagnosis of the genus with the characters of this insect as to the labial palpi and neuration, nor do I discern any tooth-like projections of scales along the inner margin of the primaries. In ornamentation, too, the insect evidently approaches *C. canicinctella*, Clem. closely, though evidently distinct from it.

D. Murtfeldtella. N. sp.

Head, palpi, thorax and basal third of the primaries pale yellowish, the remainder of the primaries being of the same general hue, but darker and more reddish, the line between the two shades distinct (that is, they do not pass gradually into each other).

Al. ex. ½ inch. Kentucky in June. Also, received from Miss Mary E. Murtfeldt, of St. Louis.

In many specimens (which should, perhaps, be regarded as a distinct species) the colors are much more distinct, and the hue varies somewhat, the basal portion of the primaries having a pinkish cast and the remainder more of a brownish purple : some of the scales in the apical part of the wing tipped with hoary or pale yellow ; these specimens are also decidedly larger than the others.

OENOE, *gen. nov.*

Head and face rough, the tuft projecting in front ; tongue short, concealed by the palpi ; maxillary palpi long, folded ; labial palpi drooping, the second joint one-third longer than the third, and with projecting bristles at the apex ; eyes globose ; no ocelli ; antennae nearly two-thirds as long as the wings, filiform ; the terminal joints with the scales arranged in whorls, and the basal joint with a few long hair-like scales depending over the eyes.

Anterior wings lanceolate ; discal cell closed by a straight discal nervure ; costal vein short ; the subcostal from before the middle sends a branch to the margin behind the middle ; another short branch behind the middle, from the end of the cell, is slightly bent upwards to the margin ; the discal vein emits two branches from a common point : the upper branch attains the costal margin, the second branch sends a branch to the dorsal margin and becomes furcate before the tip, delivering a

branch to the costal and one to the dorsal margin. The median divides into two branches at the end of the cell, both branches going to the dorsal margin ; submedian simple, rather long.

Posterior wings linear lanceolate ; the costal margin is excised from about the middle to the tip ; the costal vein attains the margin at the excision ; the subcostal is nearly straight and attains the margin at about the apical fourth ; discal cell unclosed ; a disco-central nervule is faintly indicated through the cell, becoming distinct in the apical half of the wing, when it sends two branches to the dorsal margin and attains the costal margin just before the apex ; the median vein is coincident with the dorsal margin from the basal third to beyond the middle.

This genus is nearly allied to *Eudarcia*, *Diachorisia*, but especially to *Hybroma*, Clem., differing, however, from all somewhat both in the trophi and neuration.

O. hybromella. N. sp.

Palpi brown and silver gray intermixed ; head yellowish white ; antennæ grayish fuscous, becoming more silvery towards the tip ; thorax and basal half of the forewings maroon brown, with darker brown scattered scales and small spots ; remainder of the wing white, with scattered brown scales which upon the costa and in the apical portion of the wing are condensed into loose, rather large, irregular blotches. *Alar ex.* ⅓ inch. Kentucky.

PERIMEDE, *gen. nov.*

This insect is allied to *Stilbosis*, Clem., *Laverna*, &c. It was captured in my library, where it had most probably escaped from some of my breeding cages, but I can give no account of its larval history.

No maxillary palpi ; labial palpi slender, rather sparingly scaled, reaching the vertex, widely divergent ; antennæ faintly pectinated, more than half as long as the wings ; basal joint suddenly clavate towards the tip. Head and face smooth, with the scales appressed ; face rather broad.

Wings long and narrow, with long ciliae.

Primaries longer than the body, narrowly lanceolate. Discal cell closed, the discal vein giving off one branch to the posterior margin near the tip. The costal is very short. The subcostal sends two branches to

the margin before the end of the cell, one from the end of it and one behind the cell, and attains the margin just before the tip. The median sends three branches to the dorsal margin. (Probably the discal branch above mentioned should more properly be considered the terminal portion of the median and the discal described as having no branches.) Submedian simple.

Secondaries linear lanceolate. The costal vein is very long and close to the margin; the subcostal attains the tip, its basal half being obsolete. Discal cell unclosed; median sub-dividing into four equidistant branches, the first of which attains the dorsal margin before the middle, and the last one not far from the tip.

Imago long, slender, and the single species described below has small raised tufts of scales upon the primaries.

P. erransella. N. sp.

Antennae grayish brown; face and palpi pale grayish, tinged with purple; primaries grayish brown, tinged with purple, with three small spots of raised black scales, the two first of which are margined behind and the third one before with pale ochreous; one of these tufts is near the dorsal margin before the middle, one about the middle of the disc, and one at the end of it. Under surface and legs whitish, with four distinct dark brown spots on each side of the abdomen, and the joints of the legs gray brown. *Al. ex.* nearly ½ inch. Kentucky.

LIST OF COLEOPTERA OF ST. LOUIS COUNTY, MISSOURI.

BY S. V. SUMMERS, M. D., NEW ORLEANS,

(Continued from Page 192, Vol. v.)

EUAESTHETUS, *Grav.*
americanus, *Er.*
OXYPORUS, *Fab.*
vittatus, *Grav.*
OSORIUS, *Latr.*
latipes, *Er.*

BLEDIUS, *Steph.*
semiferrugineus, *Lec.*
troglodytes, *Er.*
pallipennis, *Er.*
fumatus, *Lec.*
nitidicollis, *Lec.*

BLEDIUS, *Steph. (continued)*
annularis, *Lec.*
analis, *Lec.*
OXYTELUS, *Grav.*
insignitus, *Grav.*
sculptus, *Grav.*
nitidulus, *Grav.*
PLATYSTETHUS, *Mann.*
americanus, *Er.*
TROGOPHLOEUS, *Mann.*
morio, *Er.*
insculptus, *Fauvel.*
ANTHOPHAGUS, *Grav.*
brunneus, *Say.*
ACIDOTA, *Steph.*
subcarinata, *Er.*
OLOPHRUM, *Er.*
rotundicolle, *Er.*
emarginatum, *Er.*
LATHRIMAEUM, *Er.*
sordidum, *Er.*
CORYPHIUM, *Steph.*
notatum, *Lec.*
GLYPTOMA, *Er.*
costale, *Er.*
LISPINUS, *Er.*
laevicauda, *Lec.*

HISTERIDÆ.

HOLOLEPTA, *Payk.*
fossularis, *Say.*
HISTER, *Linn.*
binotatus, *Lec.*
interruptus, *Beauv.*
depurator, *Say.*
abbreviatus, *Fab.*
americanus, *Payk.*
bimaculatus, *Linn.*
carolinus, *Payk.*
lecontei, *Mars.*
immunis, *Er.*
foedatus, *Lec.*
harrisii, *Kirby.*
sedecimstriatus, *Say.*
PHELISTER, *Mars.*
subrotundus, *Mars.*
vernus, *Mars.*
TRIBALUS, *Er.*
americanus, *Lec.*
EPIERUS, *Er.*
pulicarius, *Er.*
regularis, *Lec.*
BACANIUS, *Lec.*
punctiformis, *Mars.*
DENDROPHILUS, *Leach.*
punctulatus, *Lec.*
PAROMALUS, *Er.*
affinis, *Lec.*
bistriatus, *Er.*
conjunctus, *Lec.*
SAPRINUS, *Leach.*
assimilis, *Er.*
seminitens, *Lec.*
patruelis, *Lec.*
fraternus, *Lec.*
ACRITUS, *Lec.*
politus, *Lec.*
fimetarius, *Lec.*
exiguus, *Lec.*

SCAPHIDIIDÆ.

SCAPHIDUIM, *Oliv.*
piceum, *Mels.*
4-guttatum, *Say.*

SCAPHIDIIDÆ *(continued).*

CYPARIUM, *Er.*
flavipes, *Lec.*
SCAPHISOMA, *Leach.*
convexum, *Say.*
suturale, *Lec.*
TOXIDIUM, *Lec.*
gammaroides, *Lec.*
compressum, *Zimm.*

TRICHOPTERYGIDÆ.

TRICHOPTERYX, *Kirby.*
haldemani, *Lec.*

PHALACRIDÆ.

PHALACRUS, *Payk.*
politus, *Mels.*
OLIBRUS, *Er.*
apicalis, *Lec.*
OLIBRUS, *Er. (continued.)*
nitidus, *Lec.*
bicolor, *Er.*
pusillus, *Lec.*

NITIDULIDÆ.

CERCUS, *Latr.*
abdominalis, *Latr.*
COLASTUS, *Er.*
truncatus, *Lec.*
morio, *Er.*
semitectus, *Er.*
CARPOPHILUS, *Leach.*
pallipennis, *Lec.*
hemipterus, *Steph.*
antiquus, *Mels.*
luridus—
CONOTELUS, *Er.*
obscurus, *Er.*
EPURAEA, *Er.*
helvola, *Er.*
vicina, *Lec.*
NITIDULA, *Fab.*
bipustulata, *Fab.*
ziczac, *Say.*
PROMETOPIA, *Er.*
sexmaculata, *Er.*
OMOSITA, *Er.*
colon, *Er.*
PHENOLIA, *Er.*
grossa *Er.*
STELIDOTA, *Er.*
geminata, *Er.*
octomaculata, *Lec.*
AMPHICROSSUS, *Er.*
ciliatus, *Er.*
PALLODES, *Er.*
silaceus, *Er.*
CRYPTARCHA, *Shuck.*
ampla.
IPS, *Fab.*
fasciatus, *Say.*
4-signatus, *Say.*

MONOTOMIDÆ.

BACTRIDIUM, *Lec.*
nanum, *Lec.*

MONOTOMA, *Hbst.*
americanum, *Aube.*

TROGOSITIDÆ.

NEMOSOMA, *Latr.*
cylindricum, *Lec.*
TEMNOCHILA, *Westw.*
viridicyanea, *Lec.*
virescens, *Er.*
ALINDRIA.
cylindrica, *Er.*
teres, *Lec.*

TROGOSITA, *Oliv.*
mauritanica, *Oliv.*
corticalis, *Mels.*
dubia, *Mels.*
nana, *Mels.*
castanea, *Mels.*
laticollis, *Horn.*
bimaculata, *Mels.*

COLYDIIDÆ.

DITOMA, *Ill.*
quadriguttata, *Lec.*
SYNCHITA, *Hellwig.*
granulata, *Say.*
nigripennis, *Lec.*
AULONIUM, *Er.*
parallelipipedum, *Er.*

PROLYCTUS, *Zimm.*
exaratus, *Mels.*
CERYLON, *Latr.*
unicolor, *Lec.*
castaneum, *Say.*

A DISSERTATION ON NORTHERN BUTTERFLIES.

BY WILLIAM COUPER, MONTREAL.

(Continued from Page 37).

The confinement of the genus *Chionobas* to high latitudes affords an example regarding distribution of species. Their food being lichens peculiar only to the Alpine regions, must confine them within a limited range. Mr. Scudder, in his "Revision of the hitherto known species of the genus *Chionobas*, of North America"—Proceed. Ent. Soc. Philad., vol. 5, pp. 26-28—gives them three or four localities; but these are either arctic, sub-arctic or Alpine. He places them also in Alpine districts—on

high mountains in temperate latitudes in Europe and America. Mr. Scudder asks "what relations of structure do the species of these different localities and varying range of habitat bear to one another?"

Specific relations are just what we want to have elucidated, but it is difficult to obtain material for this work while butterflies of the genus *Chionobas* are confined to frigid, unaccessible localities. Mr. Scudder deserves the gratitude of entomologists for his able Revision of the *Chionobas*, and in defining the species known to occur in our Northern and Alpine regions. I may here remark that I did not see a species of this genus during my two visits to Anticosti, and I cannot account for their absence from the island.

After returning from Labrador in 1867, I sent Mr. Scudder ♀ specimens of a *Pieris* taken on the south coast of the Lower St. Lawrence, at Natashquan. His answer, dated Oct. 1st, 1867, is as follows: "*Pieris:* "I am inclined to think this is *P. frigida*, Scudd., described from Upper "Labrador, but I cannot be positive without seeing some ♂ ♂ from your "collection." I had no ♂ ♂ at that time, and therefore could not send them; but I took it for granted that the species was his *Pieris frigida*.

I made a subsequent collection on the Island of Anticosti and Labrador, in 1872, and captured a number of the above *Pieris* at Fox Bay, as well as on the south coast of Labrador. The specimens were distributed to my subscribers under the name of *P. frigida*, according to Mr. Scudder's determination. The gentlemen receiving the species (all reputed entomologists) did not doubt that it was anything else than Scudder's *P. frigida* until my return from Anticosti this year. I am now informed by Mr. Grote that the *Pieris* is not *frigida*, but *Ganoris oleracea* var. *borealis*.

Now, I have before me Mr. Scudder's paper in Proceed. Boston Soc. of Nat. Hist., vol. viii, Sept., 1861, in which I quote as follows:

"*Pieris oleracea*, Boisd.
"*Pontia oleracea*, Harris.
"*Pieris cruciferarum*, Boisd.
"*Pontia casta*, Kirby.

"The butterflies described by Harris, Boisduval and Kirby under the "above-mentioned names are one and the same insect. It is found "inhabiting the northern and eastern portions of North America, reaching "rarely as far south as Pennsylvania, and extending eastward to Nova

"Scotia, at least as far west as Lake Superior, while in the North it is "found as high as the Great Slave Lake in the Hudson Bay Company's "territory, and even, according to Kirby, to Latitude 65° N. on the "McKenzie River."

I have now the mortification of finding that my Anticosti specimen of what I claim to be a *Pieris* is now *Ganoris oleracea;* but a var. to be called *borealis*. Mr. Grote says that the species resembles *frigida*, but that the peculiar elongated wings of *frigida* are wanting.

With a knowledge of the history of the Anticosti *Pieris* or *Ganoris*, whichever it may be, I am prepared to state that the former does not agree with the habits of *Pieris oleracea*, which is double brooded in Canada and quadrupled in the south, while that of Anticosti has but one brood during the season.

The egg of *oleracea* is pear-shaped or oval, of a yellow green color, and ribbed longitudinally with about fifteen sharp edged lines. The eggs are deposited singly, rarely more than one on a leaf, on the *underside*. The egg of the Anticosti *Pieris* is not pear-shaped, but oblong, pointed at each end, flesh colored, smooth and without ribs. The insect never deposits eggs underneath the leaves, but on the upper surface of its food plant *(Turritis stricta)*, and I have counted six on a single leaf. The caterpillar of the Anticosti *Pieris* is also different from that of *oleracea*. It approaches the color of that of *P. rapæ*, but without dorsal or lateral stripe, and is pubescent. In fact, it is as different from *oleracea* as the caterpillar of the latter is from *rapæ*. It occurs to me that the argument I have advanced regarding the *Papilio* of the Island applies also to this Anticosti *Pieris*. I find that after examining a number, with few exceptions, the colors are constant; and I cannot agree with Mr. Scudder that the upper surface is "supplied with obsolete spots similarly situated to "those on the upper surface of *P. rapæ* of Europe."

It is possible that the *Pieris oleracea* of the south and west may be but races of this northern form. Mr. Scudder says that "No possible "step in the gradation from one extreme to the other is wanting, and both "extremes are found equally among numerous examples from as widely "distant places as Massachusetts and the Great Slave Lake; although "the suite of specimens with which I have made my comparisons seems "to indicate that the paler forms are more commonly met with in the "more southern localities, and that more heavily marked ones are the "characteristic forms of the north."

Mr. Scudder, speaking of a white butterfly taken in Eastern Labrador, says that it is very closely allied to, but distinct from *P. oleracea*. In a note following the description of *P. frigida*, he adds: "It would be "exceedingly difficult to distinguish this species except by immediate "comparison with both sexes of *oleracea;* the differences are more easily "seen than described, although the extreme limits of variation of *oleracea* "do by no means permit us to include within its boundaries this com- "paratively persistent form; it is more heavily marked than any specimen "of *oleracea* which I have seen."

The *Pieris* which Mr. Grote has named *Ganoris borealis* is found along two hundred miles of sea-coast on Anticosti; it is quite abundant on the north shore of the Gulf, terminating in a western direction in the neighborhood of Seven Islands. It occurs throughout the north, on the Labrador Islands, into the Straits of Belle Isle, and probably Newfoundland. I am aware that *P. oleracea* occurs at Quebec, and it may extend on both sides of the St. Lawrence opposite the mouth of the River Saguenay; but it is not found below the latter river, towards the Gulf. It seems curious that *Pieris frigida* or *Ganoris borealis* should, like *Papilio brevicauda*, be confined to the north coast and islands of the Gulf of St. Lawrence, and that the caterpillar of the Anticosti *Pieris* is differently marked and the habits of the butterfly contrary from that of *oleracea*. What is the object of the study of eggs and larvæ of insects? Is it not for the purpose of determining the value of species?

The object in claiming primitive source for some of the northern butterflies, arises mainly from the fact that in them we discover permanency in form and color, while their geographical range is limited in accordance with the distribution of their food plants. That species found scattered over defined circuits are generally tending towards the equator. That many of these are but figurative races removed from their original habitat, and have varied through the influence of food and climate.

In this connection I quote an extract from Geographical Distribution of some Genera of Insects, by Francis Walker, F. L. S., Vol. iv, No. 10 of CAN. ENT.: "In studying the fauna of a mountain it is most suitable "to begin with the top, and to trace it downward, where the agencies or "forms of life become successively more numerous and complicated in "their mutual adaptations and limitations, all being as wheels which serve "to regulate the great living mechanism of which they are the parts. In "like manner, in noticing the faunas of the two primary mountains into

"which the earth is divisible, their summits being the poles and the "equator their common base, it is advisable to begin with the arctic "species or with those which have ascended to the highest latitudes. The "difference in soil, in vegetation and in elevation facilitate or hinder the "migration and settlement of insects, and help to effect the variety of "distribution, which is one of the chief attractions in the aspects of "nature."

MONTREAL BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

This branch was organized November 11th, 1873. The following officers were elected for the ensuing year :—President, W. Couper ; Vice President, M. Kollmar ; Secretary-Treasurer, F. B. Caulfield ; Council—G. J. Bowles, P. Knetzing, C. W. Pearson, W. Hibbins, jr.

The meetings of the Society are held at the residence of the President, No. 67, Bonaventure Street, Montreal, on the first Wednesday evening in each month.

ENTOMOLOGICAL COLLECTING TOUR.

We would call especial attention to a notice of an Entomological collecting tour about to be undertaken by Dr. S. V. Summers, of New Orleans, La., which will be found on the outside page of cover of our magazine. This is one of the most extensive undertakings of the sort we have ever heard of, and is well worthy of the patronage of Entomologists. The number of specimens guaranteed is extremely liberal, and the returns will no doubt well repay those who invest in the proffered shares. We are duly authorized by Dr. Summers to receive monies for shares on his account, so that any of our readers who may prefer negotiating with us will please communicate with our Secretary, Mr. J. H. McMechan.

TO OUR PATRONS.

At a special meeting of the Council of the Entomological Society of Ontario, held on the 19th of February, 1874, Mr. J. Williams, being about to remove to Montreal, tendered his resignation as Secretary-Treasurer, which was accepted with regret. Mr. J. H. McMechan having kindly consented to undertake the duties of the office, was unanimously elected as his successor. Our friends and correspondents will please bear this change in mind, and address all remittances and business communications to J. H, McMechan, Secretary-Treasurer, London, Ontario.

CORRESPONDENCE.

PIERIS RAPÆ.—About the last of September, 1873, I netted the first Rape Butterfly that I have ever seen in this part of the country—township of Dunn, county of Haldimand. It is a male butterfly, as described fig. 8, vol. 5, No. 3, CANADIAN ENTOMOLOGIST.—F. C. L.

VANESSA G. ALBUM.—I have lately received from the north-west coast of British America a specimen of *Vanessa G. album.* I do not remember hearing of its being found so far from the Atlantic before—W. H. EDWARDS.

BOOK NOTICES.

Illustrations of the Zygaenidæ and Bombycidæ of North America, by R. H. Stretch, San Francisco, California. Parts 8 and 9, with three colored plates.

The Cincinnati Quarterly Journal of Science, Vol. i, No. i, 8vo., pp. 96.

Catalogue of the Phalaenidæ of California, No. 2, by A. S. Packard, jr., M. D., 8vo., pp. 40, with one photograph plate. From the Proceedings of the Boston Soc. Nat. Hist., Vol xvi.

Nature, to February 12, 1874.

Science Gossip, February, 1874.

Newman's Entomologist, February, 1874.

The Zoologist, February, 1874.

Le Naturaliste Canadien, Fevrier, 1874,

The Western Rural, Chicago, to March 7, 1874.

Prairie Farmer to March 7, 1874.

Indiana Farmer to Feb. 28, ,1874.

Canada Farmer, to March 2, 1874.

Maine Farmer to Feb. 14, 1874.

The Canadian Entomologist.

VOL. VI. LONDON, ONT., APRIL, 1874. No. 4

NOTES ON THE LARVA AND PUPA OF SAPERDA MOESTA, LEC.

BY THE EDITOR.

On the 25th of March, 1873, I received from P. E. Bucke, Esq., P. O. Dep't, Ottawa, a bundle of twigs of the Balm of Gilead tree (*Populus balsamifera*), containing larvæ of *moesta*. These larvæ were very thickly set in the branches, in many places not more than an inch or two apart and situated chiefly at the base of the buds, where the presence of an occupant was indicated by a swelling in the branch, surmounted by a dark brown patch of partly decayed bark. The castings and debris of the food were of a light orange color, and were pushed forward, stuffing the swollen part. The whole length of the excavation made by each larva did not usually exceed an inch, and so much of this towards the front was filled with debris, that the clear space left was very little larger than its body.

The body of the larva was nearly cylindrical, tapering a little posteriorly, and about half an inch in length.

Head very small, dark reddish brown in front, with a pale streak down the centre. Color pale behind; jaws black.

Body above deep yellow, with a glossy surface, sprinkled with very minute short yellow hairs, invisible without a lens. Second segment above and below a little deeper in color, and more horny looking than the other segments; interspaces between segments strongly indented. There was a depressed dorsal line not different in color from the rest of the body, but sunken, and on each side of it the projecting rings of the body were somewhat flattened. Spiracles pale brown, rather small. Terminal segment a little more hairy than the others.

The under surface was similar in color to the upper. I was not able to detect any trace of feet, although a careful examination was made with a lens.

No further observations on these larvae were made until May 2, when I expected to find them in the chrysalis state, but was surprised to find in the several cells I opened that no pupal enclosure was to be seen, but that the head, antennae and legs were fully developed, while the wings and wing cases were only partially so. The wing cases, which covered the membraneous wings, were not more than one-eighth of an inch long, and projected out over the sides, spreading almost free from the body. At their base they were yellowish and semi-transparent, while from about the middle to the base they were black and covered with the usual small granulations. The scutellum was indicated by a short black streak widening anteriorly, while behind this the body was of a dirty yellow color and soft, flabby consistence. This color and consistence prevailed below also, behind the base of the legs, while about and anterior to them the color was black. The insect could move its legs, but was very sluggish and did not seem disposed to move at all unless disturbed; at this stage it was incapable of walking. Several of the chambers, which had been opened with care, were closed and tied up with their occupants in them; these were examined again on the 9th of May, when the abdomen was found to have decreased in size and become uniformly dark, almost black below, with the surface roughened, but still yellow at the tip. Above there was a large black patch behind the scutellum, covering nearly one-third of the body, and another large black spot near the tip, covering the 10th and 11th segments, while the interspace between these two segments was of a dark greenish hue; the elytra had lengthened so far as to cover about two-thirds of the abdomen. The beetle was more active now, and able to walk, although with difficulty.

On the 16th of May the wing cases of one were found of full length but not fully expanded so as to cover the body, while in another case they were fully developed. The twigs containing these insects had been allowed to remain in a dry room without any means being taken to keep them moist, hence they had become quite dry and brittle. On the 24th of May a fresh bundle of twigs was received from Mr. Bucke, and in these, while the greater number appeared to have been eaten by wood peckers, some five or six specimens were found in a state of chrysalis one cell was occupied by the pupa of some parasite.

The chrysalis was nearly half an inch long. Body semi-transparent; color uniform pale yellow, excepting the eyes and enclosed mandibles, which were black; the knee joints were faintly tipped with brown, and a faint brown line down each side of the scutellum. All the parts of the insect were plainly visible through the pupa case. The wings were very small and diverged to each side of the scutellum in a similar manner to that described on the 2nd of May.

On the 29th of May two of these which had been seen as pupae on the 24th, had become perfect beetles; another had its wing cases green, but its abdomen was yellow and soft; two others were still unchanged pupae. Early in June all were perfected, the beetles having escaped from their enclosures by gnawing a neat round hole through the twig, just large enough to allow of the passage of the body.

Possibly the insects I examined on the 2nd of May might have already passed through their pupa stage, and their subsequent slow developement have been due to the altered condition of the twigs containing them, owing to the dry atmosphere in which they were kept.

OBSERVATIONS ON FORMICA FLAVA, AND INFERENCES DEDUCTED THEREFROM.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

During the latter part of the month of May, of the spring of 1873, while reclining upon the ground beneath the shade of a tree growing on the outskirts of a thicket, the sun at the time beaming in all its glory and splendor overhead, my attention was suddenly arrested by the activity and excitement presented by a nest of the ordinary yellow ant, *Formica flava*. Scattered promiscously upon the earth before me were numberless larvae in various stages of developement, and not a few of immobile pupae, brought up from their subterranean domiciles by their ever active and thoughtful nurses to receive the life-sustaining benefits of the sunlight, while here and there were a dozen or more of ants that had but recently escaped from the prison-houses in which they had been confined —frail, to be sure, and with a pallid, death-like appearance, in conse-

quence of their long imprisonment, basking in the warmth of the sun to dry their bodies and to give color and tone to their systems, preparatory to entering upon the duties of the *formicarium.*

The full-grown neuters were the very pictures of restlessness. Consternation was evidently written upon their looks, if I may be permitted so to speak, and clearly evidenced in their hasty and dubious movements. The ova, larvae and pupae were being carried away to places of security beneath the ground, or hustled away to the neighboring grasses, in short, wherever their nurses could find safe and comfortable quarters for them.

Looking around me to find the cause of all this turmoil, my eyes soon rested upon two or three individuals of *Formica subterranea*, Lat. which had intruded their unbidden presence into this peaceful and hitherto happy family. There is no doubt that these ruthless invaders of this flourishing oasis of ant-life, were bent upon plunder or slaughter.

If pillage was their motive, these giants no doubt soon learned that if their weaker, more distant kin were unable to cope with them in strength, they could assuredly make up for its loss in stratagem, sagacity and numbers.

Not daring to attack their more powerful neighbors, after having sheltered the more tender, and being unable to defend their comrades who had just attained perfection and who were necessarily impotent, or to carry them to places of safety in view of their weight, in order to defeat the plans of the foe they set to work and destroyed those upon which but a few days before they had lavished the most endearing attentions.

While the major part of the workers were engaged in looking after the wants of the immature, and manifesting a readiness to provide for their further safety, should necessity demand it, a few were observed running about seizing in their mandibles thc newly developed, not to bear them beyond the reach of danger, as was at first supposed, but to save them a life of servitude mayhap, at any rate to keep them from falling a living prey to the rapacity of the enemy.

Knowing by experience the sympathy and affection which the nurses ever bear towards these frail and tender objects of their care, this act of inhumanity, so to speak, struck me as peculiarly novel and astonishing. Prompted by curiosity to know the nature of the wounds inflicted, I raised a still struggling being up, and having placed it upon the palm of

my hand, made a careful examination of it by the aid of a small pocket microscope of twenty diameters. On the superior and inferior aspects of the abdomen, between the second and third semites, were observed two deep wounds which met each other in the interior, the mandibles having penetrated completely.

Several instances of the kind occurred. It cannot be assumed that these wounds were purely accidental. It might be possible that accidents of the kind would occur once in a long time through inexperience, but to argue that insects so habituated to such manipulations as the neuters assuredly are, would be likely to make such mistakes, when it is known —especially in the case of larvae, whose integuments and tissues are so delicate and yielding by reason of early age, that the greatest caution is necessary, is, in the estimation of the writer, perfectly preposterous. Admitting, for the sake of argument, an occasional occurrence of the kind, a successive repetition of it could hardly be justified. But on the ground that a purpose is thereby subserved, there is no doubt the object had in view is justified by the means employed for its accomplishment.

What this purpose is the writer will endeavor to show in a few carefully drawn opinions. It is a well established fact, as an abundance of well authenticated instances could be cited by the writer confirmatory thereof, that many animals of many families and orders, both in the domesticated and undomesticated conditions, are wont to destroy their disabled and wounded comrades. In wild animals, in many cases, the destruction seems to be warranted in order to preserve the herd or pack from the close pursuit of enemies. Mr. Charles Darwin, in his work entitled "Origin of Species," if I mistake not the work, remarks that "Instinct or reason may suggest the expelling an injured companion, lest "beasts of prey, including man, should be tempted to follow the troop."

In tame animals, of which some well authenticated examples are recorded in the case of the hog, cow, &c., the habit is undoubtedly one which affords a beautiful and forcible illustration of what is known as the "survival of instincts."

Audubon, in writing of the Wild Turkey (*Meleagris gallopavo*), which is found in great abundance in the far West, observes substantially that the old males in their marches often destroy the young by picking the head, but do not venture to disturb the full-grown and vigorous. The feeble and immature being an encumbrance to the party, it is obvious that their destruction would tend to the latter's preservation. Should

they be actuated by sympathetic and affectionate emotions, it is evident that the constant watchfulness and attention which the weak would demand, would necessarily retard the rate of their movement, and doubtless lead to the destruction of the entire flock. Here it is plain to the most obtuse intellect that instinct or reason, the latter, as I conceive it to be, operates for individual and family good.

Granting that instinct or reason does sometimes act for individual and family preservation, in the manner described, the writer does not feel at liberty to admit that in every case that may arise in which the weak and disabled are sacrificed, that it is done for the material benefit of the physically able and robust. How the destruction of the weak and newly developed ant can result in good to the colony, it is difficult to conceive in view of the fact that not the slightest effort to escape the danger by continued flight is undertaken, the sole object being to hide the immature away from impending danger, either in the natural galleries or underneath adjoining objects. A vigilant and powerful enemy, under these circumstances, would have very little difficulty in carrying out the very spirit and letter of his programme.

There seems to be one of two theories for the writer's selection wherewith to account for in anything like a satisfactory manner, this strange and abnormal habit upon the part of an insect which has been proverbially distinguished for its kind and affectionate disposition towards the tender beings committed to its trust—either to attribute it to an utter unwillingness and repugnance to witness its *proteges* made the servants of a hostile race, or to the survival and exhibition of a habit which was in vogue far back in the buried ages of the past, when this species of *Formica* was migratory or of a roving disposition.

That a feeling of utter repugnance sometimes takes possession of the nature of some forms of animal existence, when the objects of their solicitude and care are or are about to be reduced to a state of confinement, and impels them to a course of action which bears the semblance of inhumanity, will be patent to all from what follows.

In the summer of 1873 a friend of the writer's having procured a pair of the young of *Turdus migratorius*, Linn., placed them in a cage and hung the latter on a tree, close to his dwelling, where the parent birds could still administer to their temporal well-being. All went well for several days, and the parents, who had busied themselves in the intervals of feeding in their attempts to relieve their offspring, finding all their

efforts fruitless and ineffectual, flew away, but returned shortly afterwards bearing in their bills objects of a green color, most probably worms of poisonous qualities, fed them to the young and left, never to return. A few minutes afterwards the latter were dead.

It is evident from the above that the parents, finding their efforts of no avail to relieve their young from their imprisoned condition, sought this way of saving them from a life in preference to which death would assuredly prove desirable. Other instances might be cited, but I forbear Enough has been written to sustain the writer's position, that in the case of *Formica flava* an unwillingness to suffer any of the colony to undergo a life of slavery was the controlling motive in the sacrifice alluded to.

If it could be shown in the above cases that any material good was subserved thereby, or that any advantage was acquired, the author would be free to admit that Mr. Darwin's theory to account for the destruction was the only one competent to explain all the known facts. But from the foregoing statements it is evident that a desire to save their offspring and *proteges*, on the part of parents and guardians, from the condition of involuntary servitude, no doubt is equally as important.

ON SOME OF OUR COMMON INSECTS.

14. THE COMMON COCKCHAFER—Lachnosterna quercina, Knoch.

BY GAMBLE GEDDES, LONDON, ONT.

Our readers will recognize at once in figure 8, *(Lachnosterna quercina)* the common May-bug in its different stages. 1 shows the chrysalis; 2 the larva, and 3 and 4 the perfect insect. It appears in some years in vast numbers, and is greatly complained of, whilst in other seasons it is comparatively rare. This depends chiefly on the long duration of its developement. The insect flies with a humming noise, so that one is aware of its approach at the distance of some yards. It appears principally in May and the beginning of June, and feeds upon

several trees, amongst which may be mentioned particularly the cherry tree, as well as the oak, beech, maple and poplar. It is entirely nocturnal in its habits, and during the day time is sluggish and seeks shelter under boards and logs.

The perfect insect is of a chestnut brown color on the back, with a smooth and shining coat. Underneath it is of a lighter shade of brown.

Fig. 8.

After the pairing of the sexes the male soon dies, and the female burrows into the earth about nine or twelve inches, where she deposits 60 or 70 eggs, after which she comes out and lives but a very short time. These eggs are soon hatched into small white grubs, which commence almost immediately to feed upon the rootlets of plants. As they grow the larvae become great enemies of the agriculturist. When they are hatched they are just in time for the tender vegetation of early summer.

In appearance the larva is of a white color, with a light brown head, and when full grown is about the size of one's little finger. They are constantly turning up when digging and gardening are going on, and crows and other birds will often follow the plow to pick up the white grub, to which they are very partial.

At the end of the third summer the grubs stop feeding and bury themselves deep in the ground, where, in an oval cavity, the change to the chrysalis state is accomplished.

In this condition it remains for a variable period, and then appears the perfect insect, which works its way up by degrees to the surface of the ground.

In the Report of the Entomological Society for 1872, Mr. Saunders says, in reference to this insect:

"Every one must be familiar with the May-beetle, or May-bug, as it is sometimes called, a buzzing beetle, with a rapid but wild and erratic flight, which comes thumping against the windows of lighted rooms at night, in May and early in June: and when the windows are open it dashes in without a moment's consideration, bumping itself against walls and ceilings, occasionally dropping to the floor, then rising again suddenly, it sometimes lands unexpectedly against one's face or neck, or it may be, on one's head, where its sharp claws get entangled in the hair and its further progress is stayed until a forcible removal takes place. At such times it is quite a terror to those whose nerves are weak.

"Although thousands of these summer's evening tormentors are yearly, yea, nightly trodden to death during their brief season, yet thousands of others rise to supply their places, and sometimes they are reinforced by armies of tens of thousands. Then it is that oftimes serious damage is done to trees, whose foliage they consume, their powerful and horny jaws being admirably adapted for cutting and grinding the leaves. Cherry trees are frequently injured in this way, indeed these beetles are not at all particular as to what they eat; the oak, the Lombardy poplar and many other kinds of trees are just as readily attacked, if in their way."

ON MR. COUPER'S COLLECTIONS OF LEPIDOPTERA MADE ON ANTICOSTI ISLAND IN 1873.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

The butterflies collected by Mr. Couper have been already enumerated in the "Bulletin of the Buffalo Society of Natural Sciences." They were: *Vanessa atalanta, Argynnis atlantis, Phyciodes tharos, Glaucopsyche Couperi, Cyaniris lucia, Ganoris oleracea* var. *borealis, Papilio brevicauda* and *Cyclopides mandan.* The moths, as far as the Geometridæ, have been determined by me and were as follows:

Alypia Langtoni, Couper.

Fourteen ♂ and two ♀ specimens received. The males are eight-spotted, the females six-spotted. The male is correctly described by Mr. Couper in the *Can. Nat.* It is only with difficulty that it can be separated from the male *A. octomaculata.* It appears to differ by the parallelism of the inferior edge of the basal sulphur spot on the fore wings with the margin of the wing; in *octomaculata* this spot is oblique. Neither the vine nor Ampelopsis grow on Anticosti, and Mr. Couper states that he has observed *A. Langtonii* ovipositing on the stems of grasses. I have formerly determined a specimen of *A. Langtonii* ♂, from Anticosti, sent me by Mr. Strecker, with other species of the genus, as *A. 8-maculata.*

Haemorrhagia uniformis, (G. & R.)
Hyles chamaenerii, (Harris.)
Lethia gordius, (Cramer.)
Trochilium, sp.

Ten specimens of a species that I do not venture to describe on account of the number of unidentified descriptions extant in the group.

Platarctia parthenos, (Harris.)

As early as 1864, I drew attention to the probability of Mr. Moeschler's *Arctia borealis* being identical with the present species, as also to the fact that Mr. Moeschler's papers on the Lepidoptera of Labrador had been written without reference to Kirby or the writings of American Entomologists. It is unfortunate for Mr. Moeschler that Mr. Strecker, whose acquaintance with entomological literature is so slight, should have been selected to make an unnecessary correction. Until Dr. Packard's later separation of the two species is properly contradicted, I do not understand why they should not be separately cited in a catalogue. Mr. Couper collected a single female specimen in fine condition, which seems only to differ from Mr. Moeschler's figure by the collar not being all red as Mr. M. paints it, aside from the sexual characters and the greater size. But Mr. Moeschler's description accords perfectly with my specimen where his figure contradicts it. So far as I can see, my specimen in no way essentially contradicts Harris' original description and figure in Agassiz's "Lake Superior." It is evident, however, that Dr. Packard separates an allied species from *P. parthenos*, as the *borealis* of Moeschler. Without having seen the material upon which Dr. Packard's two descriptions are based, it is useless for me to express any further opinion.

Arctia virguncula, (Kirby.)

A specimen in fine condition. Except that the figures are smaller, Mr. Moeschler's representation of *speciosa* does not seem to me to differ. I again repeat, provoked by Mr. Strecker's ill-advised remarks, that I called the attention of American Entomologists to this fact in 1864, and it seems to me that to be now charged with an ignorance of Mr. Moeschler's errors, when they were published by me ten years ago, is very absurd and shows merely that Mr. Strecker's knowledge of American Entomological works is not greater than that of Mr. H. B. Moeschler.

Phragmatobia rubricosa, (Harris.)
Hobrosyne scripta, (Gosse.)
Thyatira pudens, Guenee.

The single specimen is rubbed and appears to have the spots on the forewings more greyish than usual. It expands 48 m. m.

Agrotis gilvipennis, Grote.

As yet the only described species of the genus from America with yellow hind wings. Specimens sent to Prof. Zeller for examination were kindly determined by him as allied to the Siberian *A. chardinyi.*

Agrotis conflua, (Tr.)

I am indebted to the kindness of Mr. Geo. Norman for some fragments of Scotch specimens of this species, and although my comparisons are not as absolute as I could wish, I feel little doubt that the twenty-four specimens collected by Mr. Couper belong to this species, which is apparently not well known on the Continent. Two Swiss specimens in the collection of the Buffalo Society offer but unimportant differences, while the species seems to vary in the intensity of the color and distinctness of the markings. I have described this species and the preceding in the Report of the Peabody Academy, and I am under obligation to Mr. Geo. Norman for his assistance in this very interesting determination. According to Dr. Staudinger, the species occurs in Iceland, where it is subject to great variation in color.

Eurois occulta, Hubner.

The American specimens are generally more blackish than those from the Continent of Europe, but seem to agree with the form taken in Scotland and the north of England. Mr. Lintner's Albany specimen was more purplish and stouter, and like German specimens in the collection before me.

Hyppa xylinoides, Guenee.

One specimen.

Nephelodes violans, Guenee.

One specimen.

Heliophila commoides, (Guenee).

The three specimens are less reddish on the primaries than my material from the Middle States, with the dotted t. p. very distinct, but do not seem to differ specifically.

Pyrophila pyramidoides, (Guenee).

One specimen.

Plusia 8-signata, Sanborn.

One specimen.

Plusia simplex, Guenee.

Several specimens.

Plusia bimaculata, Stephens.

This is Guenee's *P. u-brevis;* Mr. Couper's material is in fine condition.

Plusia mappa, G. & R.

One specimen.

Cucullia intermedia, Speyer?

One specimen, much rubbed.

Tarache erastrioides, (Guenee).

Drasteria erichto, Guenee.

Two specimens.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

Continued from Page 52, vol. vi.

CHYSOPELEIA, *gen. nov.*

This genus, though closely allied to *Stilbosis*, *Walshia*, *Elachista*, &c., differs from them somewhat as to the palpi, and yet more as to the neuration of the wings. In the neuration it is near *Stilbosis*, but in many respects is nearer *Walshia*.

Anterior wings lanceolate, caudate. The costa attains the margin about the middle; discal cell long, narrow, and closed by a slightly oblique discal vein; the costal vein is furcate just before the apex, delivering one of the branches above and one below it; it also sends another branch to the costal margin from behind the cell, one at the end of the cell, and two before it; the discal vein sends a vein to the hinder margin from a point near the median, which passes straight to the hind margin, and just before the discal vein sends a branch to the hind margin also; the submedian is furcate at the base.

Posterior wings linear lanceolate. Costal vein obsolete; the subcostal proceeds straight to the apex, sending a single branch to the *hind* margin just before the apex; the median is slightly sigmoid, attaining the hind margin at about the apical one-fourth, and delivering to it three other branches, the first about the middle. Submedian short.

Wings convoluted in repose, with tufts of raised scales on the anterior ones, *and the tips bent under*. Head and face smooth, with appressed scales; vertex broader than long; face much receding and very narrow; eyes small; antennæ sub-pectinate, a little more than half as long as the wings; palpi drooping, of moderate size; no visible maxillary palpi; tongue rather short, scaled; terminal joint of labial palpi acute, and about two-thirds as long as the second, which is a little enlarged at its apex.

It is not a typical *Laruna*, and yet, possibly, ought not to be separated from it. But I place *Stilbosis*, Clem., as my precedent,

C. purpuriella. N. sp.

Very dark purplish blue, almost black, with an indistinct confused oblique yellowish fascia about the apical fourth. The tufts are black or very dark brown; one is placed within the dorsal margin, at about the basal one-fourth, opposite the space between two others placed opposite to each other, about the middle, and a fourth at about the apical fourth of the wing, also opposite the space between the second and third. The tufts are arranged thus: -⁝- *Alar ex.*, ¼ inch. Kentucky. Larva unknown.

AEAEA, *gen. nov.*

Allied to *Chrysopelia*, *Stilbosis*, &c.

Primaries lanceolate, tufted; discal cell narrow and rather acutely closed; the costal vein is short and close to the margin; the subcostal gives off three branches beyond the middle, and a fourth one from the

end of the cell, and has a common origin with the apical branch, which is bifid close to the apex. The median divides into three branches from the apical part of the cell (the submedian is furcate at the base ?)

Secondaries very narrowly lanceolate. The costal attains the margin about the basal fourth, and from thence to the tip the margin is excised; the subcostal is almost obsolete towards the base and passes straight to the tip; discal cell unclosed; the median divides into three ? branches (or into two ? with an independent discal branch arising so close to them that I have not been able to determine certainly whether it is connected with them or not).

Head smooth with appressed scales; vertex wider than long; antennæ simple, scarcely more than half so long as the wings, with a somewhat elongate basal joint. No visible maxillary palpi; labial palpi long and slender, over-arching the vertex; terminal joint about two-thirds as long as the second. Tongue moderate, densely scaled towards the base.

A. ostryædla. N. sp.

Face, palpi, legs and under surface of the body pale or hoary gray with a faint bluish tinge. Vertex, antennae, thorax and primaries dark steel gray, with a blue or purplish tinge. The basal portion of the dorsal margin of the primaries pale gray, with many of the scales tipped with hoary; behind this lighter portion of the dorsal margin is a rather large raised tuft of blackish or bluish brown scales. An oblique pale gray or whitish fascia crosses about the middle of the wing, being widest and farthest from the base on the dorsal margin, and being margined behind by two small dark tufts of raised scales. About the apical third of the wing is a second fascia of the same hue with the first, and parallel to it, with a small dark tuft of raised scales on its anterior margin and two others on its posterior margin, and in the apical part of the wing, on the dorsal and costal margins and at the apex, three or four other minute tufts of the same hue. The apical part of the wing and ciliae are sprinkled with hoary or snow-white, many of the scales being tipped with that color. *Al. ex.* scarcely ¼ inch. Kentucky.

The larva mines the leaves of the Ironwood *(Ostrya virginica).* I have occasionally, though very rarely, found a single specimen of the mine in June and July, but in August, September and October nearly every leaf upon the trees will have its mine, and many leaves will contain several. The larva is yellowish white, with the mouth ferruginous, and

two small brownish spots on top of each of the next three segments after the head, and is nearly cylindrical. It is exceedingly difficult to rear the imago, mainly, I think, because the *Ostrya* leaves dry up so quickly, and the larva will seldom make a new mine after leaving an old one, though I have sometimes known it to do so. It leaves the mine to pupate in a small whitish ovoid cocoon among the leaves on the ground. The mine is a singular one. In the natural way it begins at the junction of a vein and the midrib, and extends along the midrib to the next vein; there the parenchyma is taken out between the two veins and with the frass a little tube is constructed along the midrib, and from the mouth of the tube to the edge of the leaf two walls of frass are constructed, between which the larva, when disturbed, retreats into its tube. In the breeding cage, when the leaves are bent or the larva is crowded, it will sometimes vary the form of its mine, or even form a new one, but I doubt if in a state of nature it ever passes beyond the midrib or the two veins. From probably three hundred mines which I have gathered, I have not succeeded in raising half a dozen insects, and Dr. Clemens does not seem to have met with better success, for he does not seem to have been acquainted with the imago, though he mentions the mine and larva in his letter to Mr. Stainton of Oct. 10th, 1859, which is published with an excellent figure of the mined leaf in Mr. Stainton's edition of the Clemens Papers, page 27.

THEISOA, *gen. nov.*

Maxillary palpi microscopic; labial palpi ascending above the vertex (a little longer than in *Elachista*). Antennae simple, more than half as long as the wings. Head and face smooth.

Primaries lanceolate ovate; the costal attains the margin just before the middle. Discal cell very narrow, and closed by a very short discal nervule; the subcostal sends a branch to the margin from before the middle, another from near the end of the cell, and then is deflexed to meet the discal vein, beyond which it sends another branch to the costal margin and there becomes furcate before the tip, delivering a short branch to each margin near the tip. The discal vein is short, straight, a little oblique, and without branches. The median vein gives off to the dorsal margin a single branch beyond the middle, and becomes furcate just beyond the end of the cell. The submedian is furcate at the base.

Posterior wings linear lanceolate. The costa slightly excised from the middle to the tip; the costal vein is near the margin, which it attains at

the excision; the subcostal passes nearly straight to the apex, its basal half being obsolete; it gives off no branches. Cell unclosed; the median sends a branch to the dorsal margin about the basal fourth, and becomes furcate about the apical third. Wings horizontal in repose.

Ciliae of both wings moderately long. The neuration of the primaries is very nearly the same with that of the next described genus, *Philonome*, but is still nearer to *Elachista*, from which, however, this species differs in having the wings horizontal in repose, and the antennae longer and more pointed.

T. bifasciella. N. sp.

Palpi silvery white; face white, tinged with golden yellow, which deepens towards the vertex, where it becomes pale ochreous; antennae with alternate annulations of white and dark brown; thorax and basal third of the primaries pale saffron, slightly suffused with fuscous; at the basal third of the primaries is a silvery white fascia dark margined internally, and thence to the tip the wing is pale saffron yellow, suffused with fuscous and white and becoming darker towards the apex; at the apical third is a second white fascia, which is frequently very indistinct or even obsolete, except upon the costa, where it is oblique, distinct and strongly dark margined internally, or rather with a dusky spot on the costa before it. Ciliae dusky yellowish. *Al. ex.* nearly ⅓ inch. Kentucky in May. Larva unknown.

ELACHISTA.

E. praematurella? Clem.

This species belongs to the sub-group containing *E. nigrella* of Europe. Possibly it may prove to be one of the European species. I am not absolutely certain that my captured specimens belong to *praematurella*, as I have not seen any of Dr. Clemens' specimens, and do not, indeed, know that there are any extant. I do not know its food plant, though from the frequency with which I have found its corpse-like pupa on fallen leaves in "blue grass" pastures, I suspect that it mines that species *(Poa pratensis)*, and this suspicion is strengthened by the fact that other species of the same group mine plants of the same genus in Europe. Dr. Clemens was not acquainted with the food plant of *praematurella*. In my specimens the costal and dorsal spots are opposite as Dr. Clemens describes *praematurella*, but the fascia is a little oblique,

being a little nearer to the base on the costal than on the dorsal margin, and the wing before the fascia has a grayish hue, occasioned by minute white dusting, and Dr. Clemens does not mention these particulars in *praematurella;* but a more decided difference is that in *praematurella* the fascia is "just behind the middle," whilst in this species it is just before it. My specimens are near *E. gregsoni*, as figured by Mr. Stainton, but have less white at the apex. But the species of this group are very difficult to distinguish without comparison of bred specimens, and I have not thought it necessary to separate my specimens from *praematurella*. It is the only true *Elachista* that I have thus far met with here, though some of the immediately preceding genera approach this genus closely. Like *praematurella*, my specimens appear early in April.

BOOKS RECEIVED.

The first number of "The Cincinnatti Quarterly Journal of Science," published in January, came to hand in due season. It is a well got up octavo serial of 96 pages; editor and proprietor, S. A. Miller, Cincinnatti, Ohio; price, three dollars per year. Among the more interesting original papers contained in this number we notice one by our esteemed friend and contributor, V. T. Chambers, of Covington, Ky., on Fresh Water Entomostraca, and among the selected articles, "Facts in the Physiology of Spiders and Insects," and "Movements of Insects on Dry, Polished and Vertical Surfaces," both by John Blackwell, from the Jour. and Pro. of the Linnean Society. In addition to these there are a number of interesting original and selected papers on Geology, Botany, Zoology, &c. We sincerely wish this new journal success.

Illustrations of the Zygænidæ and Bombycidæ of North America, by Richard H. Stretch, San Francisco, vol. 1, parts 8 and 9. These two parts issued together complete the first volume of Mr. Stretch's excellent work on the Zygænidæ and Bombycidæ. These latter parts contain three colored plates, two of moths, illustrating 29 species, and one of larvae, containing 11 species. The whole volume consists of 242 pages octavo of letter-press, with ten well finished colored plates, on each of which a number of species are faithfully delineated. In this work—in addition to

the author's own material—are brought together a large number of facts and details hitherto scattered throughout the various scientific journals and publications, relating to the members of this interesting family. We hope Mr. Stretch will receive such encouragement from Entomologists as will reward him for his valued labors in this department, and stimulate him to further efforts.

Catalogue of the Phalaenidæ of California, No. 2, by A. S. Packard, jr., M. D. This is an octavo pamphlet of 40 pages, with one photograph plate, illustrating 24 new species, detailed descriptions of which are given in the accompanying letter-press, together with many other interesting facts relating to other Californian species.

EDITORIAL SUMMARY.

MR. RILEY RECEIVES A HANDSOME TESTIMONIAL.

The following correspondence explains itself:

AGENCE CONSULAIRE DE FRANCE A ST. LOUIS,
ST. LOUIS, MO., FEB. 23, 1874.

Prof. Chas. V. Riley, State Entomologist, St. Louis, Mo.:

DEAR SIR.—I have the honor to inform you that his excellency, the Minister of Foreign Affairs, has forwarded to me through the Consulate of New Orleans, the gold medal awarded to you by the Minister of Agriculture and Commerce, of France, in appreciation of discoveries in economic entomology, and especially of services rendered to French grape culture.

I congratulate you sincerely on this well deserved compliment. It is a proof that your talents and labors have been recognized by very high and competent judges.

Accept my assurance of the high regard with which I am, yours respectfully,

EMILE KARST,
Agent Consulaire de France.

The medal is of gold, very heavy and handsomely finished. It is round, probabiy an inch and a half in diameter, and bears upon its face the head of the Goddess of Liberty, in bas-relief, with the words: "Republique Francaise." Upon the reverse is:

"Mr. Riley, a St. Louis, Missouri, Services Rendus a La Viticulture Francaise, 1873," encircled by "Ministere de l'Agriculture et du Commerce."

The following is Mr. Riley's acknowledgement:

ST. LOUIS, FEB. 23, 1874.

Emile Karst, Agent Consulaire de France:

MY DEAR SIR.—Your favor of to-day is at hand. Knowledge, to the seeker after it, brings with it a reward far higher and more lasting than any outward token. Yet am I gratified to receive this testimonial of appreciation from the French Republic; because it shows that, while endeavoring. as a servant of the State of Missouri, to do what lies in my power for the advancement of agriculture within her borders, my efforts have been appreciated elsewhere. It illustrates that science—the true interpretation of nature's workings, and mighty lever to civilization and progress—is not local, but sheds her bright beams among all nations. It proves that the discovery of any fact tending to promote the comforts and conveniences of human existence, or, as Bacon so tersely expresses it, *humanis commodis inservire*, belongs not to one State alone, but to the world.

Yours respectfully,

C. V. RILEY, State Entomologist.

THE PHYLLOXERA.

The following article from the Bulletin des Sceances de la Society d'Agriculture de France, 1872, p. 514, may be of interest to some of our vine-growers as showing the good effect of an application of soot for the destruction of the grape-vine root gall-louse. However, not having tried the soot ourselves, we can only give the experience of others, and add that Dr. Erni, formerly chemist to the Department of Agriculture, in a letter from Berne, Switzerland, has also highly recommended the use of soot for the same insect.

"M. Rogier, mayor of Poule Gard, exhibited to the central society of agriculture the results obtained by the use of soot in the treatment of vines attacked by the *phylloxera*. A young vine attacked by this insect in 1869, was treated with soot put at the foot or root of each stem, in the quantity of a half kilogram, (about one and one-tenth of a pound.) The vine recovered. The following years all the stems which composed it were smoked with soot. This vine has a remarkable vigor, while the neighboring vines were dead or seriously injured. All vines treated with

soot, used as a preservative compost, are healthier, although surrounded with diseased vines."

We give the above extract for what it is worth, and hope some of our correspondents will try soot and report the result to the Department, as we have scarcely any of these destructive insects in our own immediate neighborhood. In reference to this insect, the grape-root gall-louse, the Department has received a very interesting letter from Mr. George W. Campbell, of Delaware, Ohio, in which he expresses his opinion that the aphis *(pemphigus)* affecting the leaves and that upon the roots are not identical. He says:

"I have since then found in two instances what were doubtless eggs of the *phylloxera* (root-gall-louse) upon diseased roots the same as those within the galls, but solitary, and not in clusters as in the galls. This, I think, settles the question that the aphides infesting the roots are propagated under ground, upon the roots, and that they are probably not the same as are propagated in the galls upon the leaves."

Mr. Campbell also sent specimens of the roots injured, together with numerous root gall-lice clustered upon them, but although carefully examined with the microscope, we failed to find any eggs whatever upon the roots sent. These roots, however, have been planted just as received, with the insects upon them, in a flower-pot, and placed in a large wardian case in close contact with other pots containing healthy vines, in order to find out if the insects will pass from one vine to another during the winter, and if the healthy roots will next season be infested with either root or leaf gall-lice. We give Mr. Campbell's remarks merely to stimulate further inquiry into the identity of the two insects, as many naturalists have stated them to be merely varieties of the same insect. In France, it appears that flooding the vineyards at certain seasons to drown the insect out has been recommended, but this plan, even if successful, could only be carried out in level places, and could not be adopted in side-hill vineyards.—*Monthly Report of the Department of Agriculture.*

CORRECTION.—We would draw attention to an error which appeared in Dr. Summers' advertisement last month, and which will be found corrected in the present issue. It is in reference to the time up to which shares may be secured of the material to be collected in the lengthened tour he is about to undertake. It should be up to *December*, 1874, instead of April; after that date specimens only will be for sale; we have a few yet to dispose of,—parties desiring them will please address our Secretary.

The Canadian Entomologist.

VOL. VI. LONDON, ONT., MAY, 1874. No. 5

ON SOME OF OUR COMMON INSECTS.

15.—THE COCCINELLIDÆ.

BY R. V. ROGERS, KINGSTON.

"Of all the painted populace that live in fields and live ambrosial lives," there is scarcely a family better known than those which compose the last of all the tribes of Hard-shells, the Coccinellidæ. To the young and to the old, to the illiterate and to the scientist, they are equally familiar and equally interesting. Popular sympathy is extended towards them by the elders because they do much good in preventing the excessive multiplication of Aphides; by the juveniles because they are very pretty little things and tamely pitter-patter to and fro, and their supposed misfortunes affect deeply sensitive little hearts, while infantile accents lisp "Lady-bird, lady-bird, fly away home; your house is on fire, your children are burned." They are distinguishable chiefly by the colors of and the spots upon their wing covers; the different species are sometimes difficult to discriminate; they number upwards of one thousand, and more than thirty species are known to inhabit Canada.

The general colors of the Coccinellidæ are yellow, red or orange, with black spots, and black with red, white or yellow spots, the spots being either lunate or round. Their shape is hemispherical, and although of variable size, an average specimen "bears a considerable resemblance in size and figure to an ordinary split pea; they have but very short legs and therefore creep but slowly; their powers of flight, however, are considerable." When alarmed or laid hold of, they fold up their tiny limbs and eject from the joints a yellow, mucilaginous fluid, which has a somewhat strong and disagreeable odor. This fluid entitles the pretty Lady-birds to be ranked among the *materia medica*, and to be assigned a place in the Phamacopœia, for it is a superior, cheap and never-failing

remedy of that most harrowing of pains, the tooth-ache. The learned President of the Entomological Society of Ontario says that he has never possessed sufficient courage to test its qualities himself, but a well-known American brother of the net and bottle tells us that he tried this application in two instances, and the tooth-ache was immediately relieved; but he confesses that he was uncertain whether the remedy or the faith of the patient acted therapeutically, or the tooth ceased troubling of itself. Let us be charitable and give the benefit of the doubt to the pretty little beetle.

The Germans call these insects *Marien-kaefer*, Lady beetles of the Virgin Mary; while in France they have the equally fine names of *Vaches de Deice*, or *Betes de la Vierge*, Cows of the Lord or animals of the Virgin. And they have good claims to be held in such esteem, for they are most beneficial to man in destroying the plant-lice, which, if allowed to go on propagating and increasing unchecked, would soon reduce the most fertile country into a barren and a howling wilderness. Lady-birds both in their perfect and in their larval state, feed on these lice, and, providentially, few trees, plants or shrubs infested by these disgusting and destructive creatures are to be found whereon is not also this antidote for them. The grubs, which are of a flattened shape and darkish color, spotted usually with red or yellow, and furnished with six short legs near the fore part of the body, are far more voracious than the mature insect; they creep along on the leaves of plants until they find the helpless Aphides, among which they ravage and riot like wolves in a sheep-cot, and then, doubtless, many a heart-broken Aphis parent, pointing to the aldermanic proportions of the lady, exclaim: "Foul murder hath been done; lo! here's the proof!"

Occasionally Lady-birds occur in immense swarms. Kirby and Spence relate that on one occasion the banks of the Humber were so thickly strewn with the common species, that it was difficult to walk without treading upon them; at another time they covered in great numbers the sand-hills of Norfolk, and again, the cliffs of Kent and Sussex, "to the no small alarm of the superstitious, who thought them the forerunners of some direful evil."

The eggs of these little creatures are long and oval, of a yellowish color and deposited in patches, oftimes among a colony of plant-lice, so that, thanks to the wondrous instinct of the mother, the larvae have not far to crawl to get their first hearty meal.

The larvae consume immense quantities of Aphides, and may be seen chasing, or rather, stalking the plant-lice, and eating them one after the other, taking the whole set on a leaf or stem in regular order. "The larvæ (see fig. 9) are rather long, oval, soft-bodied and pointed behind, with the prothorax larger than the other rings, often gaily colored and beset with tubercles or spines." After having eaten voraciously for the appointed time, the larva attaches itself by its tail to a leaf or a twig—after the fashion of a caterpillar—and either throws back its skin or else keeps it loosely folded about it as a protection; in this position it remains quiescent for some ten or fifteen days, and then emerges a perfect insect.

Fig. 9.

We will now briefly refer to some of the well known Coccinellidae which make the Dominion of Canada their home.

The Two-spotted Coccinella, *C. bipunctata*, Linn., is our most common species. They appear to have two broods each season; the eggs are of an orange yellow, and attached in bunches of about twenty-five to the bark of trees. They hatch out when the leaves and their natural article of diet, the Aphis, appear. The body of the larva is black, with flattened tubercles, adorned on top with spines; on each side of the first abdominal segment is a yellowish spot, and there is another broad one in the middle of the fourth segment, and one on each side. Packard thus describes the *modus operandi* of the larva becoming a pupa, and the appearance of the pupa itself: "The larva begins the operation by attaching very firmly, with a sort of silky gum, its tail to the leaf, the point of attachment not being the extreme tip, but just before it, where the tip of the abdomen of the pupa is situated. Meanwhile the body contracts in length and widens, the head is bent upon the breast, and in about 24 hours the skin splits open and discloses the pupa. The body of the pupa is black; the head is also black, and the prothorax is black and yellowish pink, with a black dot on each side, and a smaller black dot on each edge. The meso-thorax, wing-covers, scutellum and legs are shining black. The abdominal rings are pale flesh-colored, with two rows of large black spots on each side, the spots being transverse; the terga of the fourth to the seventh segments are separated, the body being arched and leaving a deep furrow between."

Fig. 10.

The Nine-spotted Coccinella, *C. novem-notata*, Herbst. (see fig. 10), is one of our most common beetles, and may be found in all parts of our Dominion; it is of a red brick color, somewhat

larger than the Two-spotted, and ornamented with nine black spots.

The Plain Lady-bird, *C. munda*, Say. (see fig. 11), is rather smaller than the others of its kind, of a light brick red, but with its elytra unadorned with any spots.

Fig. 11.

The Three-banded Coccinella, *C. trifasciata*, Linn, is of a red brick color, marked with two irregular black bands across the elytra, and a black spot near the posterior angle. It is of an intermediate size between its cousins, the Two-spotted Lady-bird and the Fifteen-spotted Mysia.

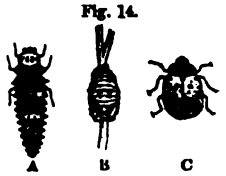
The Spotted Lady-bird, *Hippodamia maculata*, De Geer (see fig. 12) is a small pinkish beetle, but occasionally of a pale red, with large black blotches twelve in number; two of them on one elytron are opposite to and touch two on the other. Mr. Riley says that this insect commits great havoc upon the Chinch Bug, and upon the eggs of the Colorado Potato Beetle.

Fig. 12.

The Thirteen-dotted Lady-bird, *H. 13-punctata*, Linn. (see fig. 13) is rather larger than the preceding: it has thirteen black spots on a brick red ground.

Fig. 13.

Fig. 14.



A B C

The Convergent Lady-bird, *H. convergens*, Guer. (see fig. 14) is of a deep orange red color, marked with black and white. It has been of great use in checking the ravages of that destructive pest, the Colorado Bug; its larva is blue, orange and black, and in its pupa state it is of the exact color of the larvae of the Colorado Beetle, for which it is often, doubtless, mistaken and ruthlessly destroyed.

The Parenthetical Lady-bird, *H. parenthesis*, Say, is a small beetle of a dull red color, and can be easily distinguished at a glance by the dark marks, curved like the bands of a parenthesis ( ), one on the hinder part of either wing cover; there are two black spots on each elytra, besides the parenthesis, one on the anterior part and the other on the inner margin, touching the one on the other cover.

The Fifteen-spotted Mysia, *Mysia 15-punctata*, Oliv., is black on the head and prothorax, with seven black spots on each of the brownish red elytra, and another on the scutellum, according to Packard. But it appears to vary much in its perfect form and in color from a very light

grey to a deep chestnut brown. The larva, which is about half an inch in length, black on the upper surface, with a pale spot on the under edge of the prothoracic ring, and furnished with six rows of stout spinulated spines, is an inveterate foe to the larvae of the Colorado Beetle, and on page 169 of the third volume of the ENTOMOLOGIST we have a most graphic account of the summary way in which the young lady despatches the grub.

The *Chilocorus bivulnerus*, Mulsant (see fig. 15) is an obese little thing, with minute legs, of a black color, and beautified with two yellow spots.

Fig. 15.

Such are a few of the very many Lady-birds that creep among our trees and adorn our Entomological cabinets.

REMARKABLE VARIATIONS IN COLORATION, ORNAMENTATION, &c., OF CERTAIN CREPUSCULAR AND NOCTURNAL LEPIDOPTEROUS LARVÆ.

BY THOMAS G. GENTRY, GERMANTOWN, PA.

Having spent considerable time during the past season in the collection and study of various larval forms of our twilight and night-fliers, I was peculiarly impressed with the novel colors, markings, and external structural characters presented by those that were taken late in the autumn, at the period when the leaves were donning their autumnal hues. To one who has rendered himself familiar with their usual outward characters, a moment's inspection was sufficient to show a marked contrast between those taken early in the season, when the leaves were fresh and green, and those captured later, when the foliage of the trees had sustained a check to their vitality. That these larval changes have a producing cause it shall be my aim to show in the conclusion of the present article.

Of the many specimens taken by the writer during the past season, and they were confined to but a few species of as many genera, none exhibited these variations more clearly and prominently than *Telea poly-*

phemus (Attacus polyphemus of Fabricius), *Actias luna*, Linn. *(Attacus luna* of Fabricius), *Eacles imperialis* of Hubner, and the *Sphinx quinquemaculata* of authors. Before entering into a description of the anomalous forms, the writer deems it not amiss to detail the leading characters of the normal ones after their last skin moulting, and just prior to their assumption of the chrysalis condition.

Actias luna, Linn.

Attacus luna, Fabr. (normal.)

Des.—Length of caterpillar, three inches. General color, pale bluish green. Head nearly elliptical, somewhat pearl colored. Oral appendages similarly colored. A pale yellow stripe extending along each side, just below the line of spiracles, from the first to the tenth segment; narrow transverse bands of a similar color between the rings, continued from side to side, crossing the dorsum. On each ring there are six pearl-colored warts, tinged with purple, and at the posterior part of the abdomen three brown spots, edged above with yellow. Specimens captured in August whilst feeding upon the Black Walnut *(Juglans nigra.)*

Variety of same.

Des.—Length, two and three-eighth inches. General color, reddish brown inclining to dullness. Head and oral appendages similar. The lateral and transverse stripes wanting, passing, no doubt, through the various shades of yellow, orange, red, into the general color of the body. Posterior brown abdominal spots present, but lacking the yellow edging and shining very conspicuously from the depth of their color. The six pearl-colored warts, with their purple tinge, have assumed a richer hue, blazing like a coronet of rubies. Taken in October, early part, while feeding upon *Juglans nigra.* Cocoons of a beautiful reddish brown. Number of specimens taken, six.

Telea polyphemus (normal).

Des.—Length, three inches. General color, golden green. Head light brown, nearly elliptical; mouth pieces similarly colored. A transverse, conspicuously-colored yellow band on the posterior margin of the pro-thoracic segment. Six rows of gold-colored warts, two dorsal, two lateral, and two sub-lateral, reaching from the meso-thoracic to the eighth abdominal ring; each wart tipped with two moderately long blackish hairs. Between the rings, from the fourth to the tenth segment, a trans-

verse yellow band. Spiracles transversely oval, with brown centres, encircled with yellow. Taken during the latter part of August, while feeding upon *Acer rubrum.*

Variety of same.

Des.—Length 2¾ inches. General color green, with a stronger and richer tinge of yellow. Head and oral appendages a deeper shade of brown than the preceding. The warts of the color of red sealing wax along the back, but upon the lateral walls somewhat elongate oval in shape, of an orange color in the middle, deep red above and below, and with a narrow vein of the latter color encircling the whole. Spiracles transversely oval, red in the centre, and surrounded by an orange-colored border. Taken during the second week of October while feeding upon the leaves of *Acer rubrum.* Number of specimens captured, twelve. These caterpillars have a very close resemblance in markings to the normal form of the larva of *A. luna.*

Eacles imperialis, Hubner (normal).

Des.—Length, four inches. General color, varying from a dark to a light green. Head nearly elliptical, dark brown. Oral appendages similar in color. Six rows of spiniferous tubercles, two dorsal, two lateral, and two sub-lateral, extending from the first to the last segment. The meso and meta-thoracic spines moderately long and slightly curved; spiracles oval, with dark centres and yellowish margins. The entire larva invested with a dense growth of long gray hairs. Taken during the last week of August, and the early part of September. This species has been observed to feed upon *Juniperus Virginianus, J. communis, Acer rubrum* and the various species of *Pinus.* I might add here that for the past four years, in the neighborhood of Germantown, it seems to have deserted in a great measure Coniferous plants, and to have taken to *Acer rubrum.* Where I find one upon cone-bearing plants, I discover twenty upon the Red Maple.

Several varieties of the *imperialis* of Drury have been observed as late as the 12th of October, exhibiting marked contrasts from the normal form, and varying slightly from each other in the details of color and marking.

Variety A.

Des.—Length, two and three-fourth inches. General color, reddish brown. Head and oral appendages similarly colored. Spines small in

proportion to size. Entire body slightly invested with short scattered hairs. Two specimens only taken, while feeding upon *Acer rubrum*.

Variety B.

Des.—Length, two and a half inches. General color dark brown, exhibiting in certain parts a decided shade of black. In other particulars identical with Variety A. Found at the base of a pine tree. Most likely had been dislodged therefrom. It had evidently not attained its full size, since it continued to feed for nearly a week afterwards. No apparent change was observed in its color from the above, at the time of entering the ground.

Variety C.

Des.—Length, nearly three inches. General color light yellowish brown, with a dark median dorsal band an eighth of an inch long, extending from the posterior margin of the pro-thoracic to the beginning of the anal segments; a much wider one above the line of spiracles, and a similar one above that of the pro-legs. These longitudinal bands were crossed between the rings by transverse ones, similar in color. Spiracles with dark centres and yellowish rims. Entire larva presented a perfectly smooth surface, affording a striking contrast to that of the normal type. Taken upon *Acer rubrum*. Six specimens captured.

Sphinx 5-maculata (normal).

Des.—Length, three inches. General color, green. Head and oral appendages dark, inclining to black. Lateral, oblique, beaded bands of a light color, seven in number, each band passing obliquely through two segments, from the first abdominal to the anal inclusive. Spiracles nearly circular, with dark centres, surrounded by light annuli. Caudal appendage nearly black, somewhat armed with rudimentary spines. Taken in the early part of September, while feeding upon the different varieties of our ordinary white potato, *Solanum tuberosum*, L., the common Jamestown Weed, *Datura stramonium*, L., and the cultivated tobacco, *Nicotiana tabacum*, L.

Variety of same.

Des.—Length, varying from two and a half to two and three-fourth inches. General color dark, bordering on black, rivalling that of the head of the normal form. Lateral oblique bands similarly colored with

the body, their outline being indicated by the prominence due to their beaded structure. Spiracles dark, with no trace of light annuli. Observed during the middle of October, in the vicinity of Bristol, Penn., feeding upon the frost-bitten leaves of *Nicotiana tabacum*.

CONCLUSIONS.

That the abnormal forms described above should present such curious deviations from the ordinary normal type, is to me a rather interesting occurrence. That they are to be considered as the effects of a legitimate cause is a settled conviction in my mind. What the cause is it will be my aim to show. Happening at a period when the leaves of plants show a diminished state of vitality, and are assuming the characteristic hues of the season in consequence of the introduction of chemical changes into their parenchymatous material, it seems that the variations are in some way connected with *defective nutrition*. The unusually small sizes of the larvae, when compared with the normal forms, add great weight to such an opinion.

It will be seen that the colors of the caterpillars rival those of the changing leaves. In few cases all the transitional color stages from the natural one of the larva to that which is last assumed, were distinctly observed by the writer, thus clearly proving the two facts to be connected with each other in the relation of effect and cause.

If the beautiful and varied shades of green which many caterpillars present can be attributed to the green and granular chlorophyl of the leaves upon which they subsist, the conclusion must be irresistible that when chemical or other changes are inaugurated in the parenchyma of the leaf, thereby inducing color changes, the introduction of such food into the insect's economy must give rise to changes therein which will have a tendency to vary its external coloration and markings.

'Tis true that the variable colors of animals in many cases are brought about through the influence of the *will*. The changeableness of our ordinary *Hyla versicolor*, Lec., might be cited as an example, and the number of such might be prolonged to considerable length, but the cases are so numerous and so well known that it would not be advisable to give them notice in a paper like the present. In the above example the color variableness serves to conceal the animal from its enemies by adapting it to the colors of objects upon which it chances to place itself.

I do not know of any recorded instance where the larvae of the countless numbers of our Lepidoptera possess a similar faculty. Indeed, had such a case been observed, especially in a single individual of any of the above genera, I should assuredly have characterized it as one where the animal possessed the power of altering its color, in accordance with the dictates of a "will principle," whereby its protection was secured. This power of adaptation to the colors of the insects' natural food, being protective in its character, would be preserved, and thus, in the course of time, all the individuals of the species would adopt it.

But I am satisfied that the will (for assuredly these humble forms of animal life are endowed with a small degree of it) has nothing to do with these color transformations, but aver that they are due to the effects of a changed nutrition, as specimens, as above asserted, were observed exhibiting the transitional stages.

It has been shown by a French experimenter, according to the *Chronique de la Society d'Acclimatation*, that by feeding silk-worms on the leaves of the vine, cocoons of a beautiful red have been obtained, and by the employment of lettuce, others of a rich emerald green. By another Frenchman, silk of a beautiful yellow, of a fine green, and of a violet have been obtained by feeding the silk-worms on lettuce or on white nettle. An essential condition to the success of the experiment is to feed the worms on the mulberry leaves during their early ages, and to change the food twenty days prior to the introduction of the chrysalis state.

There can be no doubt that the silk-bearing glands of the caterpillars undergo a certain degree of modification, consequent upon the introduction of foreign material into the insect's economy, whereby they adapt themselves to the absorption of the proper elements from the general circulation, necessary to give to the silk its characteristic colors. It is clear that the color of the silk depends upon the food of the larva. Such being a true statement of the facts of the case, why will not a changed condition of the same food, evolved in obedience to the action of chemical or physical forces in the parenchymatous matter of the leaves, have a similar tendency? If the different capacities of different leaves to produce diverse effects are due to the chemical activities at work therein, bearing in mind that the same simple elements enter into the composition of all leaves, why will not leaves undergoing chemical and physical changes have different effects upon the tender beings that appropriate them as food, as well as the same food in a stable condition?

In caterpillars that exhibit different shades of green, their external appearances are due to the characteristic colors of their blood. If this blood undergoes changes, the muscles, tissues and other parts, which are the out-growths thereof, must evidently adapt their constitution and color thereto.

To my mind this theory seems perfectly plausible. Whatever cause may be assigned to account for the phenomena, there is no getting over the fact that the two are synchronous events.

A DISSERTATION ON NORTHERN BUTTERFLIES.

(Continued from Page 69).

BY WILLIAM COUPER, MONTREAL.

The meeting with *Papilio turnus* on the Island of Anticosti, astonished me, as I did not expect to find this butterfly so far north in the Gulf of St. Lawrence. Only two specimens were taken during the season, and old settlers say that it is always rare. Anticosti is evidently its most northerly limit, as it does not occur on the opposite shore of Labrador. It is common at Halifax, N. S., and in many localities along the south side of the St. Lawrence, until we reach the lake and rocky regions on the heighth of land from which the Assomption river flows north of Montreal. Plants of the family *Oleaceæ* are generally selected by *turnus* as food of the larvae. They feed on *Fraxinus trifoliata* and probably the Swamp Ash of the south. The Anticosti food plant of *turnus* is not known to me; it may be a species of *Fraxinus;* whichever it is, the Island of Anticosti, which stands between latitudes 49° and 50°, is evidently the most northern range of that class of plants tending to the existence of this butterfly.*

* NOTE.—Mr. Scudder gives the following food plants of *P. turnus:* Apple, wild-thorn, choke cherry, cultivated cherry, alder, tulip, bass-wood, oak, black ash and birch. The former eight do not grow on Anticosti, but the latter two may Mr. Saunders found them feeding on cherry—" CAN. ENT., vol, i, p. 74."

The Island specimens are smaller, and the dark portions of their bodies blacker than those of the west and south. Although undoubtedly *turnus*, they exhibits sufficient change of color to claim attention. Possibly the larval food is the power whereby this variety is produced. I have not had an opportunity of comparing specimens of *turnus* from widely separated localities, but it is a fact that those occurring in the latitude of Anticosti are different from the *turnus* of the south and more temperate latitudes of America.

The dark color observable in the Anticosti *turnus* supports my view that boreal insects, especially the Diurnals of high latitudes, are blacker where the dark scales occur than their congeners of the south. The fact that *Papilio glaucus* var. *turnus* * feeds on the Hickory, while *turnus* has not been found feeding on the leaves of this tree, is, in part, evidence that although the variety is thus attracted by change of appetite to an unusual plant, the true form *(turnus)* holds to those food plants which have been recorded by the early writers on Entomology.

I took a few specimens of *Colias* on Anticosti last July, which Mr. Strecker informs me are *philodice*. † This is another rare butterfly on the Island, where its habits differ from those found at Quebec. The Anticosti *philodice* is a difficult insect to capture; its flight is rapid and continuous during the occasional hours of its appearance, and it is only towards the end of July, when the weather becomes cold, that it can be easily approached. ‡ When it alights on a flower, instead of being erect on its feet, it lies sideways, as if to receive the warmth of the sun. Here, then, we have the most northern *habitat* of *Colias philodice* almost on the dividing line between the Canadian and Arctic Insect Fauna.

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* NOTE.—See CAN. ENT., vol, v, p. 9.

† NOTE.—To my subscribers I distributed an equal share of what I supposed were two species of *Colias*, taken last year on Anticosti, and one of each was sent to Mr. Grote, who did not include them in his article on the butterflies of that island.

‡ NOTE.—Its habits are similar to *Colias edusa* of Europe, which has a lively flight. Mr. Coleman says that "his pursuer has need of the seven league boots, "with the hand of Mercury, to insure success in the fair open race, if that can be "called a race at all, between a heavy biped struggling and perspiring about a "slippery hill-side, such as *edusa* loves, and a winged spirit of air, to whom up-hill "and down-hill seems all one."

I believe that the most expert Entomologist would pronounce the Anticosti *philodice* different in habit from those found in the vicinity of Canadian cities. There appears to be a difference of opinion among Entomologists in reference to the variations in this insect. Mr. Edwards, of West Virginia, says: "I suspect that at least two species are passing "under the name of *Colias philodice*. The species is known to vary "widely, but some of the supposed varieties are extreme—almost too "much to be considered varieties, unless proved to be so by actual "breeding from the egg."

The only correct method by which to arrive at a conclusion as to the species constituting the genus *Colias*, would be the tracing of the imago (true form or variety) to the plants on which it deposits its eggs. It is possible that eggs deposited by a single female on two distinct American plants may produce larvæ showing variation from each other and from the ordinary coloration of larvæ of the original type, which may have been described in another latitude, and taken on a third food plant. These variations are known to occur, and a wide difference is seen between many species which systematists term representative Ameriean forms of European types. There is no question that great deviation exists between the species which are found on the two Continents, and the cause of such variation is what is now wished to be arrived at. We find certain butterflies localized or kept within a certain range, because climate restricts the growth of the bulk of that class of plants on which they feed. In such a case, one hundred examples of the butterfly will probably show no more variation than is general between the sexes, and I give *Pieris (Ganoris) borealis* as an illustration of this fact. Larvæ of the greater portion of North American Diurnals are said to feed on from two to ten distinct plants, and I am of opinion that it will yet be proved, when proper attention is given to Entomology in connection with Chemical Botany, that many of the perplexing varieties occurring among the true forms are produced by the food * which sustain the larvae.

* NOTE.—W. S. Coleman, in his remarks on the brilliant metallic spots which adorn the chrysalides of butterflies, says: "This golden effect is produced by a "brilliant white membrane underlying the transparent yellow outer skin of the "chrysalis (*Cynthia cardui*), and it may be imitated, as discovered by Lister many "years ago, by putting a small piece of black gall in a strong decoction of nettles; "this produces a scum which, when left on cap-paper, will exquisitely gild it, without "the application of the real metal."

Late experiments made by a French Entomologist on caterpillars of a Bombyx,

The species comprising the genus *Grapta* of this country, are subje to very perplexing variations. Mr. Edwards, in vol. v, p. 148, CAN. ENT writes that Mr. Mead of New York, by experiment, identified *Grapt dryas* with *comma*. Two females of *Grapta dryas* were tied in a musli bag, which was attached to a branch of Hop-vine, on the 3rd of July "The result was a large number of eggs laid on the leaves and in th "bag." Tne eggs were all hatched on the 5th, and the first ones bega to change on the 21st (he does not state the month, but as the imagine appeared on the 30th, I suppose the time to be August). "Toward "maturity some of the larvæ were white; the others were black, like th "larvae represented in Mr. Edward's plate of *comma*."

Here, then, is one experiment with "upwards of sixty" larvae, o what is said to be the product of *dryas*, resulting in giving imagines o true *comma*. As Mr. E. does not state how many white adult larvae were seen, it appears to me that this experiment, although a good one, doe not prove the leaves of the hop to be free from eggs of another variety and it may be possible that a female of *comma* visited that vine prior t the bag being placed over the branch. We have no direct evidence tha all were the product of *dryas*.

Messrs. Edwards, Saunders, Scudder and Mead deserve great credi for their labors in metamorphic Entomology, but it appears to me that a link is missing—the *admixture* of the sexes prior to the deposition of the eggs. Were the *dryas* females the selection of *comma* males?

As illustrating the confusion in which the species of *Grapta* stand a present, two specimens sent to Mr. Edwards were stated by him to b *progne* and *gracilis*, and two similar ones sent to Mr. Strecker were reported as *faunus* and *comma*. *Faunus* is taken on Anticosti, and I am therefore inclined to think that the latter is dimorphic with *gracilis*. I found a larva of a *Grapta* feeding on wild currant, on Anticosti, a description of which was sent to Mr. Edwards, of West Virginia, who says: "I don't know what to make of the larva of *Grapta* you describe.

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were as follows: "It was ascertained that silk worms fed on vine leaves yielded silk "of a red color; when they had lettuce alone they gave cocoons of an emerald green; "nettle leaves produced violet silk, and it was also found that numerous combinations "of colors were the result of a varied diet of mixed leaves, fed during the last 20 "days of the larva period. Yellow, red, green and violet seem to be the colors most "successfully produced."

"It would not appear to be that of *progne*, which feeds on currant, as that "is olive brown in color, and this color covers nearly all the surface. "*Comma* has a yellow skin in some of its phases, with black marks. At "other times it is black, with yellow marks. It varies greatly. I do not "know that it feeds on currant. *Faunus*, Scudder thinks, is dimorphic "with *gracilis*. I don't. The larva of *faunus* feeds on willow. It may "have other food plants, but so far we only know of willow; and it "looks like the larva of *C. album*, of Europe; that is fore-half rusty "red, hind-half white, so that your description does not fit that."

Mr. Edwards, in his remarks on larvae raised from the females of *interrogationis*, describes them as exhibiting "every distinct type of "coloration, and that either type of larvae produced either sex or form "of butterfly indifferently." *G. interrogationis* has been found feeding on several plants, one of which is *Tilia pubescens*, and it will surely be conceded that there is a marked difference between the taste of the leaves of the hop and linden. If the color of a larva is affected by food taken into its system, does it not appear reasonable that the imago issuing from it will be more or less marked? Say, for instance, that *Grapta comma* feeds on two distinct plants, and that a male whose larva fed on the hop, took for its mate a female which fed on elm. In all probability a versicolor butterfly would be the result, although the form would be that of *comma*. It is on the ground of finding northern species confined to a single plant, and which presents no varieties, that I conclude that such as are extremely phytophagic are those which produce the greatest number of varieties, while their forms are lessened or extended in accordance with geographical situation. *

There are a few other well marked species inhabiting the north belonging to *Lycaenidæ* and *Hesperidæ*, but as the previous remarks apply equally to them, I shall not extend the matter. My object is to ventilate

* NOTE,—Coleman, in his "British Butterflies," remarks on the variety *Gonopteryx cleopatra*, of Europe, that M. Boisduval has proved that *G. rhamni* and the former are identical, and in a foot note adds that "they are two varieties, but "why they fly together he cannot explain; but it is possible there may be a con-"stitutional difference between individual insects, just as we see that of two English-"men going to a hot climate—one will brown deeply, while the complexion of the "other will hardly alter, although exposed to the very same external influence." In another portion of Coleman's book he thinks it possible that *Colias edusa* var. *helice* may be a male between *C. edusa* and *C. hyale*.

the subject, in order that it may be more thoroughly investigated by thos who have leisure. The theory advanced is, I think, a reasonable one,an is based upon what I have noticed in my rambles during a number (years in the woods and fields.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 77.)

ERRATA.

Page 73, line 1, for "costa" read *costal vein.*
" " 3, for "costal" read *subcostal.*
" " 23, for "place" read *plead.*
Page 75, line 7 from the bottom, for "there" read *then.*

PHILONOME, *gen. nov.*

The little insect which I have made the type of this new genus, unit in itself the characters of several genera.

Tongue naked, about as long as the maxillary palpi, which near conceal it. The maxillary palpi are about as long as the labial palpi an in the dead insect are laid upon the coxae; they are rather dense scaled, the scales being somewhat roughened. The labial palpi ascen about half way to the vertex; the first and second joints are short; th second has a minute tuft at the end beneath, and the third is about long as the first and second together, and somewhat roughened wi scales. Face broad, smooth, with appressed scales and much retreatin vertex roughened, with a large tuft of erect scales which extends dow between the base of the antennae; no ocelli; eyes moderate, visible fro beneath, but concealed above by the large eye-cap which clothes th somewhat swollen basal joint of the antennae. Stalk of the antenn simple, about two-thirds as long as the primaries.

Primaries lanceolate, almost caudate; the costal vein runs near the margin, which it reaches at about its middle. The subcostal sends two branches to the costal margin from near the end of the discal cell, which is closed rather acutely by the union of the subcostal and median veins. The first of these branches is given off at the point where the subcostal bends towards the median, and the second is given off almost from the apex of the cell. The median vein is unusually large and distinct, and from just behind the middle it sends a branch to the dorsal margin, from the end of the cell it sends a furcate branch also to the dorsal margin; from the apex of the cell a discal branch, which is almost continuous with the median, passes to apex, becoming trifurcate near the apex, one of its branches going to the costal margin near the apex, one to the apex and one to the dorsal margin near the apex. One or more tufts of raised scales.

Hind wings linear lanceolate; costa somewhat naked from the base to the basal fourth, and from thence excavated to the apex; the costal vein is close to the costa and enters it about the basal fourth; the subcostal proceeds to the apex; behind the middle it sends two branches to the dorsal margin; the median is furcate behind the middle, close to the margin, both branches entering the dorsal margin. Cell unclosed.

P. Clemensella. N. sp.

Palpi, face and eye-caps white; tuft reddish orange; antennae pale reddish orange; thorax white, with a reddish orange narrow stripe just before the apex, and a spot of the same hue on each shoulder. Primaries reddish orange, with two white basal streaks, one median, the other dorsal, the latter continuous with the white of the thorax, and extending to a small raised tuft of brown scales just before the middle of the dorsal margin; from the tuft the dorsal white streak is deflexed obliquely to about the middle of the wing, where it intersects at an acute angle the median basal white streak; at the apical third of the costa is a rather long oblique costal white streak, which is produced along the extreme costa towards but not to the base; apical portion of the wing dusted with dark brown. Ciliae whitish, with an oblique, rather wide streak of reddish orange, dusted with brown, resembling the "hook" of many species of *Gracillaria*.

Al. ex. scarcely ⅓ inch. Kentucky. Larva unknown.

I have named it in honor of Dr. Clemens, who may be called the father of this branch of Entomology in this country.

ARCTIA ARGE, Drury.

BY PROF. S. H. PEABODY, AMHERST, MASS.

A moth taken by an evening lamp, May 25, 1873, on that night ar the next day laid eggs which hatched June 14. The larvæ fed freely c the leaves of the common narrow-leaved plantain, *Plantago lanceolat* The earlier moults were not observed with care; the last two occurre June 23 and July 1.

July 6, the larvæ ceased feeding and next day began to spin the cocoons in the breeding cage. July 26, imagos appeared, copulated an laid eggs for a second brood. Other imagos appeared at about the sam time from without, showing the species to be double brooded. The cyc of transformations occupied 42 days from the hatching, 62 from th laying of the egg.

When the larvæ ceased feeding they were 1¾ inches long, ¼ inch i diameter, tapering slightly to each end.

Head small, black, marked in front with an impressed inverted λ. Fo legs black; pro-legs yellow with black fringe.

Body dark brown; a white dorsal stripe, and midway to spiracles white lateral stripe, shaded to orange on each segment; spiracles blacl an orange spot above each, and a wavy white line beneath. Underneat dirty gray; on each segment twelve black tubercles, two on each da stripe, clothed with long white hairs.

The moth is quite abundant in this locality.

EDITORIAL SUMMARY.

The Butterflies of North America, *by W. H. Edwards—Secon Series.*—We are much pleased to be able to announce that the first pa of the second volume of this admirable work will be issued during th present month, by Messrs. H. O. Houghton & Co., Riverside Pres Cambridge, Mass., the succeeding parts to appear quarterly, with fiv plates in each part. The illustrations which adorn the pages of Vol. are admirably truthful and life-like, and we have no doubt but that th forthcoming volume will in this respect quite equal its predecessor. Th talented artists who were engaged upon the plates of the previous volum

Miss Mary Peart and Mrs. Bowen, will execute the plates of this also. Illustrations of the eggs and larvæ, as well as the butterfly, in many cases will be given, which will add greatly to the interest of the work. Price $2.50 per part. We bespeak for this volume an enlarged circulation.

FRANCIS WALKER, of the British Museum, has lately published a supplement to his Catalogue of Hemiptera; also the first part of a general list of Diptera. Copies of these pamphlets may be had from E. W. Janson, 28 Museum Street, London, W. C., England.

WE HAVE received a copy of a Memorial to the Legislature of Massachusetts from the American Academy of Arts and Sciences, setting forth the desirability of a new and thorough survey of the state in which besides the usual geological matter, there should be "full descriptions and truthful illustrations of the animals and plants, including their natural history, transformations, and relations to man and his requirements, said reports to be prepared with special reference to an intelligent use by the people." The State could not make a wiser use of its funds. We heartily wish the memorialists success, feeling sure that in such a publication Entomology will receive its due share of attention.

A NEW ENTOMOLOGICAL MONTHLY.—We are pleased to learn that the Cambridge Entomological Club, organized last autumn, have determined to issue an organ to be called "Psyche," a 4-paged monthly, to begin with. The first number will be issued in a few weeks. We commend the Cambridge Club for their enterprise, and shall gladly welcome their little sheet, and sincerely hope it may live and grow.

BULLETIN OF THE BUFFALO SOCIETY OF NATURAL SCIENCES.—We have received No. 4, which completes the first volume of this valuable publication. The present part contains eight plates, making eleven in all which have appeared in the volume of 289 pages. No. 4 contains the following Entomological papers: "On the Butterflies of Anticosti," "On Eight Species of Noctuidæ," and "Determination of Brazilian Sphingidae Collected by Mr. Chas. Linden," by Aug. R. Grote; "Notes on the Species of Pasimachus," by John L. Le Conte, M. D.; "The Two Principal Groups of Urbicolae," "Note on the Species of Glaucopsyche from Eastern North America," by Samuel H. Scudder; "Notes on North American Lepidoptera," "Description of Two New Noctuidae from the Atlantic District," by H. K. Morrison; "New Phalaenoid Moths,"

"Rectification of Treitschke's Use of Hubner's Generic Term 'Cymatophora,'" by Leon F. Harvey, M. D. Price of this volume complete, Three Dollars. Part 1 of vol. 2 is now in hand, and will shortly appear; it will contain, among other articles, a catalogue of the Noctuidae of North America, embracing nearly 800 names, by Aug. R. Grote, with one colored plate. The subscription for the new volume will be Four Dollars. Remittances should be sent to Leon F. Harvey, M. D., Buffalo, N. Y.

CATOCALA RELICTA.—Mr. Robert Bunker, of Rochester, N. Y., has sent us a very nice photograph of an unusually dark female specimen of *relicta*. He says: "It is well known that this species alights usually on white surfaces; the specimen from which this photograph was taken was captured on a surface as dark as itself."

BOOKS RECEIVED.

Proceedings of the Boston Society of Natural History, vol. xvi, part 2, June, 1873—Jan., 1874, with two plates and several wood-cuts.

On the Oviposition of the Yucca Moth, from the American Naturalist, pp. 4, by Prof. C. V. Riley.

Controlling Sex in Butterflies, from the American Naturalist, pp. 9, by Prof. C. V. Riley.

The Grape Phylloxera, from the Popular Science Monthly, pp 16, with seven cuts, by Prof. C. V. Riley.

The Grape Phylloxera, False Theories. From the New York Weekly Tribune, by Prof. C. V. Riley.

Lepidoptera, Rhopaloceres and Heteroceres Indigenous and Exotic Part 9, with one colored plate containing figures of eleven species of Catocala, by Herman Strecker, Reading, Pa.

Note on the Species of Glaucopsyche from Eastern North America, 8vo., pp. 2, by Samuel H. Scudder, Cambridge, Mass.

The Two Principal Groups of Urbicolæ (Hesperidæ, Auct.,) 8vo., pp. 2, by Samuel H. Scudder, Cambridge, Mass.

The Pterostichi of the United States, from Proc. Acad Nat. Sci., Philadelphia, July 27, 1873, pp. 19, by John L. Leconte, M. D.

Synonymical Remarks upon North American Coleoptera, from Proc. Acad. Nat. Sci., Phila., pp. 16, by John L, Leconte, M. D.

Notes on the Species of Pasimachus, from Bul. Buffalo Soc. Nat. Sci., pp. 8, by John L. Leconte, M D.

On the Origin of Insects and Remarks on the Antennal Characters in the Butterflies and Moths, from Proc. Amer. Assoc., pp. 3, by Aug. R. Grote.

The Natural History of a Polymorphic Butterfly, from the American Naturalist, May, 1874, pp. 10, by Samuel H. Scudder.

Report Dept. Agriculture, Washington, April and May.

Science Gossip, March and April.

Nature to April 16th.

Le Naturaliste Canadien, Mars et Avril.

The Zoologist, March and April.

Newman's Entomologist, March and April.

Journal of Education, Feb'y.

Prairie Farmer to May 9.

Indiana Farmer to May 2.

Canada Farmer to May 1.

Western Rural to May 9.

Bruce Reporter to May.

The Canadian Entomologist.

VOL. VI. LONDON, ONT., JUNE, 1874. No. 6

ON SOME OF OUR COMMON INSECTS.

16.—THE GOOSEBERRY SAW-FLY (Nematus ventricosus, Klug.)

BY THE EDITOR.

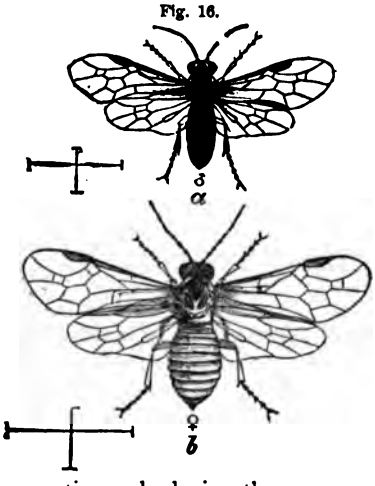
This prolific pest, known also in the larval state as the Currant Worm, is now so widely disseminated, and, at this particular season of the year, so abundant and destructive, that it may well be classed among our commonest insects, and is one in which all cultivators of the gooseberry and currant must take some interest.

The Saw-flies, the parents of this troublesome brood, usually spend the winter in the chrysalis state, enclosed in a tough, papery-looking, silken cocoon, sometimes on and sometimes under the surface of the ground, and occasionally fastened on the stems of the currant or gooseberry bushes on which they have been feeding, or in some sheltered spot near by. They make their appearance very early in the season, usually about the third week in April, but sometimes a week later, depending on the temperature; and by the time the gooseberry bushes are bursting into leaf, these enemies have paired, and the females are ready to deposit their eggs on the new and tender foliage. The gooseberry bushes develope leaves before the currant bushes, and whether it is from this cause alone or from a preference for the gooseberry foliage, we know not, but we find that the gooseberry is the first attacked, and often, if let alone, many bushes will be stripped quite bare of foliage before the eggs deposited on the currant are hatched; on this account the gooseberry bushes require the first attention.

Both male and female flies are represented in fig. 16, but magnified. The upper one (*a*) is the male, *b* the female; the hair lines below show

their natural size. The male is nearly as large as the common house-fly, but with a more slender body and glossier wings. Its head is black, spotted with dull yellow, with the antennae brownish black; the thorax or anterior portion of the body is black, with a yellow spot at the base, and in front of each of the fore wings; the abdomen or hinder portion is black above, yellowish underneath and at the tip. Its legs are bright yellow; the wings glossy, with black or brownish black veins. The female is larger than the male and differs from it chiefly in the color of the body, being mostly yellow, instead of black. These flies are active only during the warmer parts of the day; at other times they are quiet, indeed almost torpid.

Fig. 16.



The eggs are laid on the surface of the larger veins or ribs on the underside of the leaves; they are arranged in long and regular rows, as shown in fig. 17, each female depositing about a hundred or more. We have counted as many as 118 squeezed from the body of a female just escaped from the chrysalis, and as the eggs are then very soft and easily ruptured, it is probable that some of them were broken in counting, and thus escaped notice. This process of egg-laying is continued throughout May, so that you have eggs hatching almost daily during the latter part of the month, on bushes which are, perhaps, covered with worms from half an inch to an inch long. It is probable that the female fly lays her stock of eggs at one time, and that the subsequent deposits are made by those who have escaped later from the pupa state. The eggs, as found on the leaves, are about one-twentieth of an inch long, four times as long as broad, rounded at each end, and having a

Fig. 17.

whitish glossy surface. As squeezed from the body of the insect they are not much more than half this size, which indicates that they must expand considerably after being laid. The exterior of the egg is thin and elastic, and contracts and shrivels up as the young larva escapes; the usual duration of the egg stage is from a week to ten or twelve days.

The larvae or worms, when first hatched, are about one-twelfth of an inch long, with a greenish white, semi-transparent body and a large head, having a dark round spot on each side. At first they eat small holes in the leaf on which they are placed, as shown at 2 and 3, fig. 17, feeding in company, from 20 to 40 on a leaf, the soft parts of which they soon consume, leaving nothing but the frame-work; as they increase in size they eat the veins as well down nearly to the foot-stalks, and, travelling from leaf to leaf, they soon strip the branch on which they have been located, when they spread to other parts of the bush, which is sometimes stripped quite bare of foliage by these marauders in a few days.

Fig. 18 represents the larva nearly full grown. It is then about three-fourths of an inch long, with a black head and a bluish green body, becoming yellowish on the hinder segments and on the sides. Its whole upper surface is thickly covered with small, shining black tubercles or raised dots, from each of which arises a single black hair. Low down on each side, in a line with the spiracles, is a row of larger black tubercles from each of which there arises several short black hairs; the terminal segment has a patch of black above. The under surface is pale bluish green, growing yellowish towards the extremities, with a few faint brownish dots; feet nearly covered with patches of black. Prolegs—of which there are seven pairs—pale greenish. After the last moult, just before entering the chrysalis state, it becomes of a uniform plain green color, tinged with yellow.

Fig. 18.

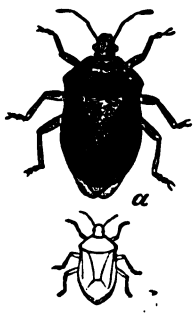
Having completed its growth, its chief concern now is in the selection of a suitable place in which to pass the chrysalis stage of its existence.

Such a spot having been fixed on, the larva begins to contract the length of its body and to spin a cocoon over itself, which, when finished, is nearly oval, smooth, of a brownish color and papery texture, and within this it changes to a small brown chrysalis, from which the fly escapes late in June or early in July. Shortly after this eggs are again deposited, from which another brood of worms are hatched; these complete their growth before summer closes, and in most instances change to chrysalids before winter, and thus these tormentors lie dormant until spring comes round again.

There may possibly be more than two broods during the season; it is certain that there are not many weeks during the whole of summer when you cannot find the larvae on the bushes in some stage of their growth. It is well known that the flies composing the separate broods do not all appear at one time; some are weeks later than others, and their progeny are later in proportion; but whether this tardiness in maturing on the part of some specimens is sufficient to account for the almost continual presence of the larvæ from May to September, we are unable at present to decide.

The Saw-fly has natural enemies, but, unfortunately, they do not as yet appear anywhere in sufficient numbers to materially lessen its increase. One small parasitic insect attacks the egg, and there are two other species which prey upon the larva. Besides these we have another friend in a member of the Heteroptera or true bug family, see fig. 19. This insect is about the size of a common Lady-bird, with the head, thorax and legs black, and the abdomen red, with an elongated black spot in the centre, crossed by a whitish line. On approaching one of the worms they thrust into it their sharp proboscis and quietly suck its juices until it shrivels up and dies. In the figure this insect is magnified; the outline below shows its natural size.

Fig. 19.



It is fortunate that we have a remedy which is sure and speedy, and while it brings sudden death to the worm, does not injure either the bushes or fruit. We refer to powdered Hellebore, which is best used by mixing two tablespoonfuls of the powder in two or three gallons of water, and showering it on the bushes with a watering pot.

ON TWO NEW SPECIES OF NOCTUIDÆ.

BY H. K. MORRISON, OLD CAMBRIDGE, MASS.

Hydræcia semiaperta. Nov. sp.

Antennae serrate. Collar arched, ochreous at its base, brown above. Behind the collar the usual longitudinal sharp-edged thoracic crest. Abdomen with a thick, short tuft on its first segment. ♀ with an extended ovipositor. Anterior wings above brown, with ferruginous shades. All the transverse lines dark brown, regular and distinct. Half line present. Interior line undulate above the median nervure; at the latter point it is bent inwardly, and advances in a nearly straight line to the inner margin. Median shade very distinct, broad, not clearly defined along its edges, strongly angulated on the median nervure, and then nearly touching the reniform spot. Exterior and subterminal lines obliterated on the costa, below distinct, sub-parallel, broadly undulating, the former dentate between the median branches.

Ferruginous stains on the median and subterminal spaces, particularly just before the subterminal line and between and beyond the ordinary spots. Terminal space in fresh specimens showing a purple reflection. Orbicular spot small, ferruginous, ringed with brown. Reniform spot long and narrow, pure white, crossed by the black nervules, its upper half frequently more or less overspread with ferruginous shades. Nervules black, with irregularly occurring white atoms. Fringes long, edged with a basal and exterior black line.

Posterior wings dark fuscous, lighter at the base; a black line at the base of the brown fringe.

Beneath, the most conspicuous feature is the broad, black, wan exterior line, which extends over both wings. Discal dots present. On the anterior wing, before the exterior line, the wings are blackish. The costa subterminal and terminal spaces of the anterior, and the whole of the posterior wings violaceous brown, sprinkled with numerous black atoms.

Expanse, 34 to 37 m. m. Length of body, 16 m. m. *Hab.* Mass., New York. Not uncommon. Coll. of H. K. Morrison.

In color this species most nearly approaches *sera*, G. & R.; in the form of the spots, *lorea*, Guen.

The white reniform spot is not a sexual character, as in *nictitans*, Linn., but common to both sexes.

The regular, distinct, median lines, particularly the broad angulated median shade, the white reniform, and the continuous exterior line beneath, afford a ready clue to its determination.

Hadena congermana. Nov. sp.

Palpi, vertex, the upper portion of the collar, and the tegulae ferruginous brown. The basal portion of the collar, a broad, dorsal, thoracic band, and the abdominal tufts dull ochreous. Anterior wings uniform dull red, with the nervules brown. The transverse lines, with the exception of the subterminal, almost entirely obliterated, represented by white dots on the costa and nervules, but in some cases the ground color is slightly lighter along the ordinary course of the lines. Subterminal line more distinct, showing the usual ≷-shaped marking between the median nervules, set off and followed by a lighter line. Terminal space lighter than the rest of the wing, particularly at the apex and internal angle, where are formed irregular ochreous spots. Orbicular spot reduced to a pale dot, encircled with brown. Reniform as in the common *sputator* Grote (*Bul. Buf. Soc. Nat. Sci., vol. i, p. 190*), kidney-shaped, with an internal brown annulus following the shape of the spot. Posterior wings white at the base, with a broad, diffused light fuscous terminal band. Beneath the wings are yellowish white, with reddish atoms terminally and traces of the exterior line. Expanse, 35 to 38 m. m. Length of body, 18 m. m.

A rare species. *Hab.* New York, and one specimen taken at Beverly, Mass., June 24, 1867, by Mr. Edward Burgess, who has generously given me this and many other interesting species of Noctuidae.

A very detailed description of this species is not necessary; it is another member of the same little closely related group of *Hadena*, of which *dubitans*, Walk., and *sputator*, Grote, are the only species. It is the smallest of the group (expanding 35 to 38 m. m., while *sputator* expands 42 to 46 m. m., and *dubitans* 48 to 50 m. m.,) but it resembles nearest in color *dubitans*, the largest.

Its best character is the orbicular spot, reduced merely to a whitish dot, surrounded with a brown ring. In the other species the orbicular, although obscured by the ground color, is of the usual size. It can be easily distinguished by the dull red ground color of the anterior wings, the almost white posterior wings, the dorsal thoracic band, and the white conspicuous reniform.

THE PRESERVATION OF CATERPILLARS BY INFLATION.*

BY SAMUEL H. SCUDDER.

Many persons are deterred from collecting caterpillars by the difficulty and expense of preserving them in the ordinary way. The easy and inexpensive method of blowing up and mounting the pellicle is so little known in this country, that at the last meeting of the American Association, only one entomologist besides myself had ever seen the operation; since then others have tried it, and been delighted with its simplicity. In the hope of inducing all our entomologists to experiment for themselves, the following explanation of the process has been prepared.

It should be premised that caterpillars may be prepared in this way, so as to retain their colors far better than by any other method, and often to to be fit subjects at any subsequent time for the artist's pencil; the most delicate processes may be preserved uninjured, and the examination of hairy or spiny appendages made even more readily than during life. Specimens taken from spirits, unless absolutely naked, are always difficult to examine from the matting of the hairs; and the internal organs can seldom be studied, even in the rudest manner, unless the greatest care has been bestowed upon their preservation; in fact, no specimen can be fitted by any process for the study of both internal and external organizations, and for the latter, no method of preparation compares with that of inflation.

The instruments necessary for the operation, besides the tools in the hands of every entomologist, are a small tin oven, a spirit lamp, a pair of finely pointed scissors, a bit of rag, a little fine wire and a straw.

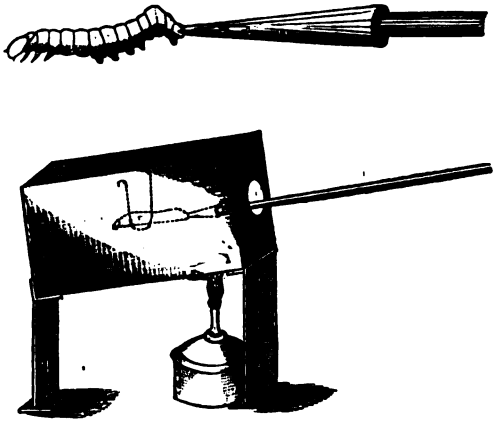
The oven is simply an oblong tin box, about 2½ inches high, 2½ inches wide, and five inches long; the cover is of glass, and one end of the box is perforated by a circular hole 1¼ inches in diameter. It would be well to have this end of glass, and the opposite end should be movable; the oven rests upon an open standard of twisted wire or riveted tin plates, as in the woodcut (fig. 20.) No soldering should be used upon the oven or standard, as it would soon be melted. Mr. Riley suggests that there would be an advantage in having the front end of the standard higher than the back, as he has shown in the sketch. He also proposes

*From advance sheets of the *American Naturalist*.

a movable wire loop, indicated in the woodcut by the dotted line,* but this would seem superfluous.

The wire should be very fine and annealed; the best is that wound with green thread and used for artificial flowers. It should not be more

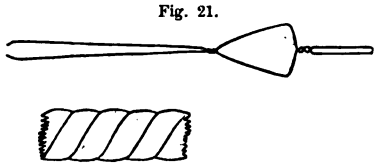
Fig. 20.



than half a millimetre in diameter; the cut represents it magnified nineteen diameters (fig. 21).

The straw. Mr. Goossens, of Paris, my courteous instructor in this art, who possesses a collection of nearly a thousand species of inflated caterpillars, uses nothing but ordinary wheat straw, choosing stout, dry pieces of various sizes, the cross section of which is perfectly circular; with these he inflates the smallest micros and the largest sphingidae.—Various modifications have been suggested; a glass tube drawn to a fine point, and provided with a pair of spring clips to attach to the caterpillar, is a favorite form; the Germans use this largely, and sometimes attach the caterpillar by threads passed around the anal prolegs. Dr. LeConte informs me that Dr. Gemminger uses a finely pointed tube with an elastic bulb attached, like a rubber syringe. Mr. Riley suggests (as his drawing represents) still another mode, which is to pierce a piece of soft wood along the grain with a fine heated wire

Fig. 21.



* The engraver should have made this loop hang from the edges of the oven.

and then sharpen to a point the tube thus formed, to be inserted in the caterpillar; a tube is also inserted in the other end (see fig. 21.) For myself I prefer the simple straw.

The operation. Kill the subject by a drop of ether or by a plunge in spirits; if it be a hairy caterpillar, it should remain at least half an hour in alcohol, and then rest on bibulous paper for forty-eight hours; otherwise the hairs drop off in the subsequent operation. Then placing the caterpillar in the left hand, so as to expose its hinder extremity beyond the gently closed thumb and first two fingers, enlarge the vent slightly at the lower edge by a vertical cut with the scissors; next lay the larva either upon bibulous paper on the table, or upon soft cotton cloth held in the left hand, and press the extremity of the body with one finger, always with the interposition of cloth or paper, so as to force out any of the contents of the rectum; this process is continued from points successively farther back, a slight additional portion of the contents of the body being gently pressed out with each new movement. Throughout all this process great care should be taken lest the skin should be abraded by too violent pressure, and lest any of the contents of the body soil its exterior or become entangled in the hairs or spines; to avoid the latter, the caterpillar should be frequently removed to a clean part of the cloth or paper. When a portion of the intestinal tube itself becomes extruded, it should be seized with a pair of strong forceps, and, the head remaining in the secure hold of the left hand, the tube should be forcibly but steadily torn from its attachments; with this most of the contents of the body will be withdrawn, and a delicate pressure passing from the head toward the tail will reduce the subject to a mere pellicle.

The alcohol lamp is now lighted and placed in position beneath the oven; a straw is selected, of the proper size to enter the enlarged vent, and the tip, after being cut diagonally with sharp scissors, is moistened a little in the mouth (to prevent too great adhesion of the skin to the straw) and carefully introduced into the opening of the caterpillar; the process may be aided by blowing gently through the straw. When the skin is slipped upon all sides of the straw to the distance of nearly a quarter of an inch, without any folding of the skin and so that both the anal prolegs protrude, a delicate pin (Edelston and Williams, No. 19, is best) is passed through the anal plate and the straw.

By this time the oven will be sufficiently heated to commence the drying process, which consists simply in keeping the caterpillar in the

oven, extended horizontally upon the straw by blowing gently and steadily through the straw, as one uses a blow-pipe. Too forcible inflation will make the caterpillar unsightly by distending unnaturally any spot that may have been weakened or bruised in the previous operation; the caterpillar should be kept slowly but constantly turning, and no harm will result from withdrawing the creature from the oven and allowing it to collapse, to gain breath or rest; only this relaxation should be very brief. The caterpillar should be first introduced into the oven while inflated by the breath, and so placed that the hinder extremity shall be in the hottest part, directly above the flame, for it is essential that the animal should dry from behind forward; yet not altogether, for as soon as the hinder part has begun to stiffen (which can readily be detected by withholding the breath for a second) the portion next in front should receive partial attention, and the caterpillar moved backward and forward, round and round over the flame. During this process any tendency of the caterpillar to assume unnatural positions may be corrected—at least in part—by withdrawing it from the oven and manipulating it; during inflation, the parts about the head should be the last to dry and should be kept over the flame until a rather forcible touch will not cause it to bend.

To secure the best results, it is essential that the oven should not be too hot; the flame should not be more than an inch high, and its tip should be one or two inches from the bottom of the oven.

When the skin of the caterpillar will yield at no point, it is ready for mounting. The pin is removed from the straw and the caterpillar skin, which often adheres to the straw, must be gently removed with some delicate, blunt instrument, or with the finger nail.

A piece of wire a little more than twice the length of the caterpillar is next cut, and, by means of forceps, bent as in fig. 21, the tips a little incurved; a little shellac* is placed at the distal extremity of the loop, the wire is held by the forceps just beyond this point, so as to prevent the free ends of the wire from spreading, and they are introduced into the empty body of the caterpillar as far as the forceps will allow; holding the loop and gently opening the forceps, the caterpillar is now pushed over the wire with extreme care, until the hinder extremity has passed half-way over the loop, and the shellac has smeared the interior sufficiently to hold

* To prepare this, the sheets of dark shellac should be preferred to the light, and dissolved in forty per cent. alcohol.

the caterpillar in place when dry: the extremities of the parted wires should reach nearly to the head. Nothing remains but to curve the doubled end of the wire tightly around a pin with a pair of strong forceps and to place the specimen properly labelled, in a place where it can dry thoroughly for two or three days before removal to the cabinet.

For more careful preservation and readier handling, Mr. Goossens employs a different method, placing each specimen in a glass tube, like the test tube of the chemist. The wire is first bent in the middle and the bent end inserted in a hole bored in the smaller end of a cork of suitable size, so as nearly to pass through it; the loops are then formed as above; both ends of the cork are varnished, and a label pasted around the portion of the cork which enters the tube, thus guarding both specimen and label from dust, and the latter from loss or misplacement. After two or three days the cork with the caterpillar attached is placed in its corresponding tube, and the tube may be freely handled.

Modifications of this system will occur to every one. Dr. Gemminger uses a syringe for the extraction of the contents as well as for the inflation of the emptied skin. For an oven, the Vienna entomologists employ an ordinary gas-chimney, open at both ends and inserted in a sand bath, which prevents, perhaps, the danger of too great heat.

TRANSLATION OF THE SYNOPSIS OF THE GENERA OF EUROPEAN MYCETOPHILIDÆ.

BY FRANCIS WALKER, LONDON, ENGLAND.

The Diptera, generally considered, are less attractive than other orders of insects, and appear to be more insignificant, but are the most useful on account of their excessive abundance and of their purification of matter and thereby of the atmosphere. In like manner, the Diptera may be divided into more or less numerous and beneficial tribes, and the work assigned to the former is the removal of decaying substances. The fungus race is in subjection to the Mycetophilidæ, and are the means for the developement of the perfect state of the latter, according to the law whereby degradation precedes the attainment of a higher state, and this law is exemplified in minerals, plants and animals. In like manner the

Mycetophilidæ among themselves exhibit much difference in utility and beauty, the former quality being exemplified by Mycetophila with its skipping and shuffling movements; the latter by the graceful form of Macrocera when it rests on a shady paling. The four following sub-families of Mycetophilidæ are distinguished from the others by each of them including more than one genus:

Sub-family MYCETOBINÆ.

A—Brachial vein and cubital vein forming a sessile fork... 1 MYCETOBIA
B—Brachial vein and cubital vein forming a petiolated fork.
a—Base of this fork nearer to the base of the wing than is the base of the 2nd hind areolet..... 2 DITOMYIA
b—Base of this fork more distant from the base of the wing than is the base of the 2nd hind areolet..... 3 PLESIASTINA

Sub-family CERATOPLINÆ.

A—Mouth elongated like a beak.. ... .1 ASINDULUM
B—Mouth not elongated like a beak.
a—Antennæ dilated; palpi not bent together.....2 CEROPLATUS
b—Antennæ not dilated; palpi bent together.....3 PLATYURA

Sub-family SCIOPHILINÆ.

A—Costal vein extending to the tip of the wing.....1 SCIOPHILA
B—Costal vein not extending to the tip of the wing.
a—Base of the 4th hind areolet much nearer to the base of the wing than is the base of the 2nd hind areolet.....2 EMPHERIA
b—Base of the 4th hind areolet a little nearer to the base of the wing than is the base of the 2nd hind areolet.
*—Second hind areolet with a very long petiole.....3 POLYLIPTA
* *—Second hind areolet with a moderately long petiole.....5 EMPALIA
c—Base of the 4th hind areolet in a transverse line with the base of the 2nd, or very near the base of the wing.....6 TETRAGONEURA
d—Base of the 4th hind areolet much more distant from the base of the wing than is the base of the 2nd hind areolet.....4 LASIOSOMA

Sub-family MYCETOPHILINÆ.

A—Three ocelli on the front.
a—Abdomen with seven segments.

*—Proboscis not elongated.
†—Costal vein extending beyond the tip of the cubitus.
‡—Basal part of the cubital vein and middle transverse vein equally long.
§—Auxiliary vein not extending to the costal vein.....1 SYNTEMMA
§§—Auxiliary vein extending to the costal vein .....3 ANACTINIA
‡‡—Basal part of the cubital vein longer than the middle transverse vein.
§—Base of the 4th hind areolet under the base of the cubital vein.....2 LEPTOMORPHUS
§§—Base of the 4th hind areolet nearer to the base of the wing than is the base of the 2nd hind areolet.....4 BOLETINA
§§§—Base of the 4th hind areolet more distant from the base of the wing than is the base of the 2nd hind areolet..6 PHTHIRIA
††—Costal vein not extending beyond the tip of the cubitus.....7 GLAPHYROPTERA
**—Proboscis elongated.....5 GNORISTE
b—Abdomen with six segments.
*—Hind vein forked.
†—Fork long.....8 LEJA
††—Fork short.....9 COELOSIA
**—Hind vein not forked.
†—Middle discoidal vein forked.....10 AENEMIA
††—Middle discoidal vein not forked.....11 AZANA
B—Three ocelli: one on the inner border of each eye; the third in the middle of the fore front.
a—Costal vein extending much beyond the tip of the cubital vein.
c—Two ocelli; one on the inner border of each eye.
a—Base of the 4th hind areolet nearly in a transverse line with that of the second hind areolet.....25 MYCETOPHILA
b—Base of the 4th hind areolet much more distant from the base of the wing than is the base of the 2nd hind areolet.....26 DYNATOSOMA
c—Base of the 4th hind areolet much nearer to the base of the wing than is the base of the 2nd hind areolet.....27 CORDYLA
†—Petiole of the second hind areolet long.....20 EXECHIA
††—Petiole of the 2nd hind areolet short.....24 MYCOTHERA
****—No 4th hind areolet.

†—Fore cubital areolet moderately broad.....21 ZYGOMYIA
††—Fore cubital areolet very narrow.....22 SCEPTONIA
‡—Hind vein not forked.
‡—Hind vein forked.....23 EPICYPTA
*—Base of the 4th hind areolet in a transverse line with that of the 2nd hind areolet.....12 DACOSIA
**—Base of the 4th hind areolet more distant from the base of the wing than is the base of the 2nd hind areolet.18 ANATELLA
b—Costal vein extending a little beyond the cubital vein.....19 PHRONIA
c—Costal vein not extending beyond the tip of the cubital.
*—Base of the 4th hind areolet a little nearer to the base of the wing than is the base of the 2nd hind areolet.
†—Petiole of the 2nd hind areolet very short.....14 RYMOSIA
††—Petiole of the 2nd hind areolet moderately long.....15 ALLODIA
**—Base of the 4th hind areolet much nearer to the base of the wing than is the base of the 2nd hind areolet.
†—Costal vein ending much before the tip of the wing..13 BRACHYPEZA
††—Costal vein ending a little before the tip of the wing.....16 BRACHYCAMPTA
***—Base of the 4th hind areolet and that of the 2nd about equally distant from the base of the wing.....17 TRICHONIA
****—Base of the 4th hind areolet much more distant from the base of the wing than is the base of the 2nd.

NOTES ON COLLECTING LEPIDOPTERA.

BY G. M. DODGE, GLENCOE, DODGE CO., NEBRASKA.

In collecting Catocalas at Ohio, Ill., I have found them, during July, invariably abundant upon Black Locust *(Robinia pseudacacia)*, which, at that time, exudes considerable sap from the holes made by borers. Last season I pinned rags, dipped in molasses, to three or four of these trees, and from the middle to the last of July obtained from them over thirty Catocalas of ten species. On suitable evenings I would visit the trees with a lantern and cyanide bottle; several times between sunset and ten

o'clock, p. m., earlier or later, I had little success. I seldom used a net, preferring that a specimen should escape rather than capture it in a damaged condition.

In August and September decayed apples or pomace from the cider mill, spread upon trunks of trees, will attract the late species of Catocala such as *cara*, *concumbens*, &c., and a host of the lesser Noctuidae.

Limenitis misippus and *ursula* are also very fond of the juice of apples. I have often seen the former species feeding upon apples that were being sun dried, and both may be observed around apple trees upon which the fruit is over-ripe. Upon more than one occasion, by wetting my fingers with apple juice, and holding them near an *ursula*, as it sat upon a leaf above me, I have induced it to leave its perch and alight on my hand, where it would remain until the last drop was sucked up. Where the rarer species of this genus are found, it would seem that apple might be successfully used as a bait.

The objection to cyanide offered by Mr. Norman, in No. 1, Vol. vi, does not seem to me a sufficient reason for discarding it. Although cyanide certainly "renders the moths rigid," the difficulty can be overcome. My Catocalas, taken in the evening, remained in the bottle all night, and next morning were transferred to a close box. At noon they were soft enough to spread without difficulty.

NEW CANADIAN NOCTUÆ.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

Perigrapha Normani, Grote.

♂ ♀. The eyes are hairy, the tibiæ unarmed. The collar is cut out in front and there is a slight tuft in front, on the dorsum of the thorax, while the sides of the patagia are determinate. Dark leather brown; thorax concolorous, with the inner edge of the patagia with a more or less obvious bordering of dark scales. Forewings shining leather brown, deepening in tint over costal region, somewhat darker mottled. Lines distinct, continuous, geminate, with lilac-grey centers distinctly con-

trasting. Basal half line bent on median vein, continued to interna nervure. T. a. line nearly even, slightly outwardly arcuate, very slightl notched on costal and median veins. Orbicular very indistinct; i appears large, spherical, outlined by a ringed shade of a lighter brow than the ground color. Reniform large and wide, with a distinct darke inner annulus, and with an enclosed blackish stain on the median vei inferiorly. T. p. line like the first two transverse lines, exserted roun the reniform, nearly even. There are three grey ante-apical costal dot while the apices are distinctly washed with a grey shade, which obtain beyond the subterminal line over costal region on the terminal spac Terminal line very vaguely indicated. Hind wings whitish, with a vagu fuscous terminal shade and the veins stained with blackish, darker in th female, fringes whitish. Beneath pale, with a common line appearing b blackish nervular dots and streaklets; a discal point on secondaries, whic have whitish fringes, while beneath the fringes of the fore wings are brow (as above) and contrast. *Expanse*, 32 m. m. St. Catharines, Georg Norman, Esq.

Matuta. N. g.

Habitus of *Taeniocampa* and *Perigrapha;* the thoracic and caputa squamation is woolly. The eyes are, however, naked and lashed, no hairy, as in allied genera. The hind and middle tibiae are spinose, an the form is not flattened, as in *Glaea (Cerastis*, Led.) The ♂ antenna are simple, not pectinate, as in *Pachnobia.* The fore wings are broad entire and widen outwardly, with full and rounded external margin. I color the species resembles *Ceramica picta;* the lines are obsolete, excep the subterminal, which, with the ordinary spots, is grey. The thorax ha the collar distinctly lobed, as in *Perigrapha*, and the sides are well defined there seems to be no dorsal tuft, while the wings are broader than in tha genus. The habit is that of *Taeniocampa* and *Lithophane;* the perfec insect has been taken by Mr. Geo. Norman, in May.

Matuta Catherina, Grote.

♂. Dark and deep red brown; the fore wings are brighter colored outside of the t. p. line, and at base below the median vein. The media transverse lines are hardly to be made out against the blackish red brow color of the wing; the t. p. line is seen to be single and regularly inter spaceally scalloped and accented on the nervules. The stigmata contras by their grey color; the orbicular well sized, spherical; the reniform

proportionate and enclosing a blackish inferior stain as in allied genera. The subterminal line is quite distinct, being indicated by a line of powdery greyish scales, like the stigmata. There is an extremely fine grey, wavy terminal line *before* the margin, formed by the outer edging of the deeper tinted marginal line which appears as interspaceal points. Fringes light brown, cut by a fine darker hair line (preceded by a pale line) without the middle. Hind wings pale, much soiled with fuscous and with the pale fringes ruddy tinted. Beneath fuscous, with a rufous tinge, both wings rather dark, with discal marks and a broad, vague, common shade line. Thorax like fore wings; collar above with indistinct pale edging; palpal tips pale, as is the front, else the head is rufous. *Expanse*, 32 m. m. St. Catharines.

Besides the foregoing, Mr. Geo. Norman has secured specimens, in beautiful condition, of the following Noctuæ, on Catkins, in May:

Lithophane vulgaris, G. & R. (*socia* of my List); *Lith. disposita*, Morr.; *Lith. Bethunei*, G. & R.; *Lith. ferrealis*, Grote (allied to the European *L. semi-brunnea*, Haw); *Lith. laticinerea*, Grote.; *Morrisonia vomerina*, Grote; *Actinotia ramosula* (Guen.,) and *Taeniocampa alia* Guen. These species are mostly additions to the Canadian lists. It is improbable that *Taeniocampa instabilis* occurs in N. Am.; and *T. alia* has probably been mistaken for it.

The following species of European Noctuæ are credited to North America with apparent certainty:

Agrotis augur (Fabr.)
" *baja* (W. V.)
" *c-nigrum* (Linn.)
" *plecta* (Linn.)
" *fennica* (Tausch.)
" *conflua* (Treits.)
" *saucia*, Hubn.
" *segetum* (S. V.)
" *suffusa* (S. V.)
Mamestra grandis (Boisd.)
" *brassicæ* (Linn.)
Hadena arctica, Boisd.
" *rurea* (Fabr.)
Dipterygia pinastri (Linn.)
Euplexia lucipara (Linn.)

Heliophila pallens (Linn.)
Pyrophila tragopoginis (Linn.)
Xanthia gilvago (W. V.)
Scoliopteryx libatrix (Linn.)
Plusia gamma (Linn.)
" *ni*, Hubn.
Anarta cordigera (Thunb.)
" *melanopa* (Thunb.)
Heliothis armigera, Hubn.
Euclidia cuspidea (Hubn.)

Besides the foregoing, other species are occasionally attributed North America, such as *Hyppa rectilinea*, for which *H. xylinoides* is taken; *Agrotis nigricans*, for which *Agr. tessellata* is mistaken, etc. With the exception of the boreal species of *Anarta*, the foregoing list embraces all the European species I feel as yet at all sure are properly credited North America.

ANNUAL MEETING OF THE MONTREAL BRANCH.

The first annual meeting of the Montreal Branch of the Entomological Society of Ontario was held on May 6th, 1874, when the following officers were elected for the ensuing year:

W. Couper, President; G. J. Bowles, Vice-President; F. B. Caulfield, Secretary-Treasurer; G. B. Pearson, Curator; Council—W. Hibbins, sr., C. W. Pearson, P. Knetzing.

The reports of the Council and Secretary-Treasurer were read, and motion adopted. The Branch, although young, is in a prosperous condition, the expenses of the past year having been met, leaving a small balance on hand, and the list of members is gradually increasing. Owing to the lateness of the season but little field work has been done, but some rare captures have been made already. The Branch meets as usual at the residence of the President, No. 67, Bonaventure Street, Montreal, P. Q. All business communications to be addressed to the Secretary-Treasurer, F. B. Caulfield, 254, St. Martin Street, Montreal, P. Q.

CORRESPONDENCE.

A THIRSTY SPIDER.

DEAR SIR,—

On the sixth of April my attention was drawn to a small black spider running on the inside of my window-sill. In the course of its travels it came to a drop of water that had trickled from the window pane, when it stopped and commenced drinking.

Wishing to see what it would do, I touched it with my finger, when it set off at a great rate; passing near another drop, it ran to it and again commenced drinking, this time turning out of its path in its eagerness to reach the water.

I have sometimes seen Lepidopterous larvæ drinking, but had never observed a spider doing so before.

F. B. CAULFIELD, Montreal, P. Q.

DYSAUXES MEDIASTINA.

DEAR SIR,—

Dysauxes mediastina, Hubner, Zutrage, figs. 505, 506, must be erased from the list of American Lepidoptera, the locality assigned to it by Hubner being erroneous. The figures quoted above are excellent representations of an Australian insect which I have received from New South Wales. This is not the only erroneous locality which has crept into Hubner's writings, as those who have studied the volumes will have discovered.

Yours truly,

R. H. STRETCH, San Francisco.

PLATYSAMIA COLUMBIA, *S. I. Smith.*

DEAR SIR,—

In March last I found a cocoon on a maple tree, in the east end of this city, which bore a very close resemblance to *P. cecropia*, only it was not much more than half the size. I compared it with Mr. Bowles' description of *columbia*, and as it differed in some respects, I supposed it to be *cecropia*. All doubts were, however, removed by the appearance of the imago on the 13th May, which proved to be a fine male specimen of *columbia*. I believe this is the first that has been taken in Montreal.

C. W. PEARSON, Montreal, P. Q.

EDITORIAL SUMMARY.

We have received from our esteemed friend, J. A. Lintner, of Albany, N. Y., No. 3 of his Entomological Contributions, from the 26th Annual Report of the New York State Museum of Natural History, 8vo., 76 pp., with many cuts. These yearly contributions are valuable additions to our Entomological literature, giving us in terse language the facts and observations recorded by one of our most accurate and pains-taking fellow laborers. The present No. is divided into 12 chapters, in each of which much will be found to interest the practical Entomologist. The first is on the larva of *Eudryas unio* and allied forms. Then follow—"Transformations of some Bombycidae," "Descriptions of Larvae of some Bombycidae and Noctuidae," "Notes on New York Bombycidae and Noctuidae," "Descriptions of New Species of Cucullia," &c., &c. We trust Mr. Lintner will receive every encouragement from the directors of the New York State Museum in the prosecution of his valued labors.

The promised list of the Noctuidae of North America, by Aug. R. Grote, has come to hand. It is a goodly octavo pamphlet of 77 pages, with one colored plate illustrating eleven new species. The first 58 pages are occupied with the catalogue proper, which is conveniently indexed and gives evidence throughout of great care and labor in its compilation; the remaining pages are filled with descriptions of some 35 species, many of which are new. As stated in our last, this list will appear in the forthcoming number of the *Bulletin of the Buffalo Society of Natural Sciences*. For the convenience of Entomologists, separate copies have been struck off, which may be had by remitting $1.50 to the Secretary, L. F. Harvey, M. D.

Psyche.—The first number of this little Entomological monthly has appeared. It is nicely printed on good paper, and we doubt not, from the array of names of noted Entomologists composing the Cambridge Entomological Club, of which this is to be the organ, that it will be well sustained.

The Butterflies of North America, by W. H. Edwards.—Part 1 of the second series is just at hand, with five beautifully colored plates, in which the drawing and coloring are both elegant and faithful. We know of no illustrations so charming and correct as these are. If all the succeeding parts of the forthcoming volume equal in design and execution that which we are now noticing, vol. 2 will be a fitting sequel to vol. 1. Figures of the larva and egg in several instances accompany those of the perfect insect.

The Canadian Entomologist.

VOL. VI. LONDON, ONT., JULY, 1874. No. 7

NOTES ON THE LARVÆ OF ARGYNNIS CYBELE, APHRODITE AND DIANA.

BY W. H. EDWARDS, COALBURGH, W. VA.

I am now able to give the results of my attempts at raising the caterpillars of the three Argynnides, *Cybele*, *Aphrodite* and *Diana*, from the egg, this past season. In August and early in September, 1873, females of *cybele* were easily obtained, and a few of *aphrodite*, which is a rare species here, and these were shut up in kegs, within which were placed pots of growing violets. The eggs were laid abundantly on the leaves and stems, and on the cloths which covered the kegs. There were soon several hundreds of *cybele* eggs, and many of *aphrodite*. About the same time, Mr. T. L. Mead, who was at Coalburgh, made an excursion to a region about fifty miles east of us, where *diana* had been previously found by him in some numbers, and brought back with him about sixty females, which were placed in kegs and boxes, also with violets either in pots or planted in earth in the boxes. Hundreds of eggs were so obtained of this species. The three species hatched in from seven to twelve days, and so far as was possible, the larvae at large were transferred to plants, but of course many were lost. In a few instances some of them were observed to feed on the leaves, but almost all began their hybernation at once after hatching, and fixed themselves on the under sides of the leaves, and especially in the grooves of the leaf-stems, where some of them were to be seen, extending quite down to the base of the stem. The three species were so nearly alike at this stage that *cybele* and *aphrodite* could not be distinguished apart by any glass I had, and *diana* differed almost imperceptibly from the others.

They were each about one-twentieth of an inch long, cylindrical, with brown heads; the body greenish brown, with rows of tuberculated darker colored spots, from each of which emanated a black hair.

As the weather became cool the plants gradually lost their leaves b drying up; mould began to attack the decaying leaves, and I wa compelled to transfer the caterpillars to fresh plants, which at this seaso I had much trouble in providing. In fact I had to raise a number o plants from off-shoots in the house, to be ready for any emergency. Th transfer was effected by using a pin bent at the point. The larvae woul curl up when touched, and were easily hooked and so moved. Whe placed on the new plants they would soon straighten out, and chang position sufficiently to make themselves comfortable. But as the proces had to be repeated several times as the winter progressed, a great man of the larvae were lost. I placed the pots in a small greenhouse abou the 1st of January, hoping to see the caterpillars revive and commenc feeding, and had the satisfaction soon after of seeing this desired resul take place. On the 9th of January I noticed some of the *cybele* wer active and had been feeding; on the 21st, *aphrodite* and *diana*. The very soon began to increase in size perceptibly, and were active in running about the leaves and in wandering off the flower pots. I should hav lost these lively ones had I not confined them to the plants by glass lam chimneys and glass globes. But in these the air was no doubt too con fined for an *Argynnis* caterpillar (though a *Grapta* would have thrived, for many died; and I came near losing them all in a way that I had no provided for, the gardener having taken occasion one day, when I wa absent from home, to smoke the entire house with tobacco, forgetting t remove my pots.

From this catastrophe emerged about a score of *cybele*, half a dozen *aphrodite*, and a few of *diana*. These larvae all throughout this perio grew very slowly, no doubt owing to the cooling down of the house a nights, so that it was the 27th of January before I was able to see that an had passed the first moult. The first to change was *cybele*, which now appeared in a coat of smoky brown, covered with long fleshy spines, from which sprung many short black bristles. These spines were of the general appearance shown in the several successive moults. In all there were five moults to each of these species, and until the fourth they maintained their close resemblance to one another, so that had one from either lo escaped to another, I could not have separated them. They were cylindrical, thick, furnished with six rows of stout black spines, from the ends and sides of which sprung stiff bristles. The color of the body was silky brown or black, and at bases of part of the spines were yellow o fulvous spots. The heads were bilobed, brown or black, much tubercled,

with conical vertices, and the back of the head was yellow or fulvous; the spines of the second segment were rather longer than the rest and projected forward horizontally over the head. After the fourth moult there were some differences. *Cybele* became larger than *aphrodite*, though not varying much in other respects, the one measuring at maturity about two inches in length, and the other about one and a half inches. But *diana*, which was also large, like *cybele*, at the fourth moult, displayed spines of immense size, nearly twice the length of those of the other two species. These radiated from the central axis of the body, like spokes from the hub of a wheel, the lower lateral row drooping so that the ends were on the level of the feet. The spines of the second segment, four in all, two dorsal and two lateral, were a formidable protection to the head. It was a superb creature.

The mortality had been so great among all these larvae that at last, as they approached maturity, they were reduced to but three or four of *cybele*, two of *aphrodite*, and one of *diana*, and how to preserve these was a matter of much anxiety. I arranged a keg with a high gauze bag over the top of it, which bag was confined by the upper hoop, and in the keg were planted violets every two or three days, as the leaves were consumed. This plan seemed to answer well, affording plenty of air, and I regretted that I had not tried it sooner. The larvae were fond of resting high up the sides of the bag, or on elevated sticks under it, coming down when impelled by hunger. After remaining motionless for hours, they would suddenly arouse themselves and start off in extreme haste, wandering all round the enclosure, and when leaves were reached, would eat ravenously and then climb up to rest again. I sometimes found them extended on the earth, and no doubt they appreciated the coolness and dampness of it.

Only three *cybele* went into chrysalis. They spun buttons of white silk and soon hung suspended, nearly straight, the anterior segments but little bent, and so continued about two days, when the change to chrysalis occurred. The first change was on the 19th of May, and three months and ten days from the awaking from hybernation. The chrysalis yielded the imago in twenty-three or twenty-four days, and the whole period from the laying of the egg to the imago was just thirty-eight weeks. One *aphrodite* only fastened for chrysalis. This was on the 14th of May, and the change occurred on the 15th, an interval of about thirty-six hours Unfortunately this insect died in chrysalis.

Diana fixed on the 17th, and became a chrysalis on the 19th, the interva being about fifty-four hours. This yielded a butterfly on the 9th of June after twenty to twenty-one days. The chrysalids of the three bore a strong likeness to each other, being all of the same general shape, and may say in brief that they would be tolerably represented by the figur of the chrysalis of *A. aglaia*, in Humphrey's British Butterflies, althougl much larger than that figure. The length of *cybele* and *diana* was rathe over one inch; *aphrodite* was as long, but more slender than the others and it, as well as *diana*, was prettily streaked and variegated in brown anc red; *cybele* was plain brown, and in one case yellow brown, with littl ornamentation. By Miss Peart's assistance I was able to obtain a com plete series of drawings from egg to chrysalis of each species, and of th several moults of each, and I propose to introduce these figures in cours of Vol. 2, Butterflies of N. A.

Cybele was flying this year at Coalburgh, on the 1st of June, anc these early examples must have come from larvae that began to feed afte hybernation in March, as the food plant then would first appear abov ground, so that the larval period after hybernation, when in the natura state, would be two months shorter than in the cases related above.

With regard to the food plant, I used every species of wild viole accessible from the woods, and during the winter cultivated species, anc discovered no preference for one more than another. The wild violet were in flower part of the time, and the flowers were eaten by the cater pillars with avidity. The contrast between the habits of these larvae anc those of other genera not far separated from them, according to th received arrangement, is something remarkable—as *Grapta*, for instance One is in the preparatory stages nine months in the year, is impatient o confinement, extremely tender and raised only by the greatest care; th other is hardy, indifferent to confinement, and completes its cycle in abou thirty days, from the laying of the egg to the appearance of the butterfly one is single brooded, the other many brooded, at Coalburgh there being three or four. The number is probably dependant in any latitude upor the length of the season.

There are one or two points in the life history of the large Argynnides that are not yet clear. With us, *cybele* ♂ is on the wing from the 25th of May to the 10th of June, as I have noticed for several successive years. Probably *aphrodite* nearly as soon, and *diana* first appears about the 20th of June. Shortly after the 1st of June the ♀ o

cybele is to be seen, and both sexes abound in the clover fields. By the end of June *cybele* has become scarce, and the individuals to be seen have lost their freshness and are broken and worn. It is certain that these early appearing females have not matured eggs and laid them, because at no time from June to August will anything but rudimentary eggs be found by dissecting, and the eggs do not become distinguishable to the eye until August. They then mature rapidly, and in a few days attain full size. I am confident that no eggs are laid till August. But about the first of that month and all along to near the end of it, there appear in great numbers both fresh males and females, as if just from chrysalis, with no abrasion of the hairs on thorax between the wings, which spot is the first to show wear. (I doubt if an *Argynnis* could fly two days without thus giving evidence of it.) There are flying at the same time many worn individuals, especially females. These last are the first to deposit their eggs, but shortly after, and up to the time of frosts, the others also are in condition to do the same. I see no explanation of the appearance of these freshly emerged butterflies than that they have formed part of the brood of caterpillars hatched the previous fall, some of which brood yielded the butterflies that came out in May and June, and the remainder continued in the larval or chrysalis state until August, and upon these last the perpetuation of the species largely depends, for nine-tenths of the June flight must have been destroyed long before August. If I am right, the preparatory stages of the August *cybele* must consume eleven months out of the twelve.

CATOCALA WHITNEYI, *N. sp.*

BY G. M. DODGE, GLENCOE, DODGE CO., NEBRASKA.

Expands 1 ¼ inches. Primaries light gray, the outer third brownish, with a triangular gray spot near the apex. A narrow black line near the base of the wing extends from the costa to the submedian vein. Parallel to this and farther out, a black patch, narrowest at the costa and broadest on the second median veinlet, extends nearly across the wing, ending at the submedian vein. A triangular black patch surrounds the brownish reniform spot, and immediately back of this a curved black line reaches from the sub-dorsal vein to the second median veinlet. The secondaries

are yellow. The black median band is curved, constricted in the mid and ends abruptly at the submedian vein. The marginal band is broad at the apex, is sometimes broken opposite the termination of the med band, and extends but little beyond the submedian vein. There is small yellow apical spot. Fringe on fore wings brown; on hind wi whitish, partly brown at base.

Beneath the prevailing color is yellow, being lighter outwardly. T median band of the posteriors is narrower than above, and prolonged scattered black scales toward the anal angle. The marginal band unbroken. Lunule black. Thorax and collar light gray. About o third or less of the specimens taken are brown instead of gray. T median band also varies in width.

I name this species in honor of Mr. C. P. Whitney, of Milford, N Hampshire. My specimens were taken at Ohio, Ill., but it also occ here. It is the only Catocala that I have ever seen attracted by flowe

THE FOOD-PLANTS OF EUROPEAN BUTTERFLIES.

Second Notice.

BY SAMUEL H. SCUDDER, CAMBRIDGE, MASS.

The third and concluding part of Kaltenbach's work *(Die Pflan feinde aus der Classe der Insecten)*, has just been received in this coun and contains the following notices of the food plants of Europ butterflies, in addition to those previously given.* The numbers parentheses refer to the former list.

1. *Melanargia galathea*—Phleum pratense.
2. *Erebia medusa*—Panicum, Setaria.
3. " *æthiops*—Dactylis.
4. " *ligea*—Milium effusum.
5. *Satyrus hermione*—Holcus lanatus.

* See CANADIAN ENTOMOLOGIST, vi, 21-25.

6. *Satyrus circe*—Lolium, Bromus, Anthoxanthum.
7. " *briseis*—Sesleria and other grasses.
8. " *semele*—Several species of Aira.
9. " *dryas*—Avena elatior.
10. *Pararge mæra*—Poa annua, Glyceria fluitans, Hordeum murinum, Festuca.
11. " *megæra*—Triticum and other grasses.
12. " *ægeria*—Triticum repens.
13. " *achine*—Lolium teriueleutum, Carex.
14. *Epinephele janira*—Poa annua and other grasses.
15. " *ida*—Triticum cespitosum.
16. " *tithonus*—Poa annua.
17. " *hyperantus*—Milium effusum, Poa annua, P. pratensis.
18. *Coenonympha hero*—Elymus Europæus and other grasses.
19. " *iphis*—Brachypodium sylvaticum, Cynosurus and other grasses.
20. " *arcania*—Melica nutans.
21. " *corvinna*—Triticum cespitosum, Carex gynomane.
22. " *pamphilus*—Poa, Anthoxanthum.
23. " *tiphon*—Festuca elatior.
24. (12). *Vanessa L. album*—Hippophae rhamnoides, Gooseberry, Birch, Purple willow.
25. (15). " *antiopa*—Salix capræa.
26. (32). *Melitæa maturna*—Fagus sylvatica, Scabiosa.
27. (34). " *cinxia*—Aira canescens.
28. (46). *Thecla W. album*—Prunus spinosa.
29. (47). " *ilicis*—Quercus.
30. " *quercus*—Quercus.
31. (59). *Lycæna icarus*—Medicago minima.
32. (67). " *semiargus*—Anthyllis vulneraria.
33. (86). *Pieris daplidice*—Diplotaxis tenuifolia.
34. (87). *Aporia cratægi*—Quercus.
35. *Thais polyxena*—Quercus ilex.
36. (97). *Syrichtus malvæ*—Fragraria vesca, Agrimonia eupatoria.
37. *Hesperia thaumas*—Aira montana, Festuca, Phleum.
38. " *lineola*—Arrhenatherum avenacium.
39. (100). *Hesperia sylvanus*—Avena pratensis, Holcus lanatus, Festuca.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 97.)

COLEOPHORA.

[Antennae and palpi both simple.]

C. zelleriella. N. sp.

Slate color, tinged with ochreous; apex of the abdomen yellowish two longitudinal dusky lines on top of the abdomen, which, however, are invisible in the dead specimen. *Al. ex.* $\frac{9}{16}$ inch. Kentucky.

The case is ochreous, slender, cylindrical, tapering a little to each end, and compressed or pinched at the posterior end, so as to divide it into three small ridges. It is about half an inch long, and was found adhering to the bark of sugar trees *(Acer saccharinum.)*

C. argenti-albella. N. sp.

Silvery white; some parts of the legs and under surface tinged with yellowish. *Al. ex.* $\frac{9}{16}$ inch. Kentucky. Larva and food plant unknown. The long, slender case was found adhering to the bark of beech trees *(Fagus Americana).*

C. gigantella. N. sp.

White, with seven longitudinal streaks upon the primaries, golden or ochreous yellow according to the light; one extends from the base just within the costal margin to the beginning of the ciliae. Two other parallel and oblique ones from the base near the costa to the dorsal margin near the apex; these are in the apical part of the wing, between the costal one and the first oblique one, and the seventh is within the fold, extending from the base to the dorsal ciliae.

Al. ex. $\frac{5}{8}$ inch. Collection of Mr. Wm. Saunders, London, Ont.

C. aeneusella. N. sp.

Greenish bronzy; posterior wings pale fuscous. *Al. ex.* 5 lines. Kentucky.

This species belongs to the section constituting Stephens' genus *Metallosetia.*

[Antennae simple, second joint of palpi tufted at the apex.]

C. fagi-costicella. N. sp.

Yellowish white ; a pale ochreous yellow streak from the base along the middle of the wing to near the end of the disc, where it becomes furcate and passes on into pale ochreous yellow of the apex ; dorsal margin pale ochreous yellow, and a pale ochreous yellow streak just within the costal margin. *Al. ex* .½ inch. Kentucky. The streaks are all obsolete or nearly so.

The larva and food plant are unknown, and I am perhaps wrong in naming the species for the *habitat* in which I have always found the pupa. I have found it so invariably upon the bark of beech trees as to make me suspect that the larva feeds on beech leaves, or on the moss and lichens which grow upon the bark. The larva case is almost cylindrical, tapering a little to each end, with a bent neck or tube at the anterior end, and compressed or pinched together at the other end, so as to be deeply concave on the upper surface ; about the middle or just behind it its outer envelope is scalloped or serated so as to present three or four deep seratures or processes, looking as if the inside case had been inserted into the small bracts of a young leaf bud, from which the bud had first been removed.

C. unicolorella. N. sp.

Entire insect grayish drab, unicolorous. *Al. ex.* ⅓ inch. Kentucky. Larva and food plant unknown.

This can not be *C. concolorella* Clem., which is yellowish ochreous without markings.

C. ciliæochrella. N. sp.

Silvery white, becoming gradually tinged with reddish ochreous to the apex of the primaries, the ciliae of which are distinctly reddish ochreous ; antennae alternately annulate with white and brownish yellow. *Al. ex.* 5 lines. The tuft on the palpal joint is very small.

[Basal joint of the antennae with a small tuft ; palpi simple.]

C. rufo-lutecella. N. sp.

Head white ; lower portion of the face tinged with yellowish ; a spot on the vertex, and tuft of the basal joint of the antennae yellow ; antennæ white, each joint annulate at its base with yellowish brown, and a few joints at the base entirely of that hue ; thorax and anterior wings deep

reddish orange, deeper, almost brown towards the apex; sides of t thorax and costal margin to the ciliæ white. *Al. ex.* nearly ½ inc Kentucky. Captured in June.

[Basal half of the antennæ thickened with scales; palpi simple.]

C. auropurpuriella. N. sp.

Entire insect, according to the light, golden brown or golden purp with a greenish bronzy hue, especially towards the apex of the primarie where the greenish tinge is very decided; apical half of the antenn annulate with silvery white. *Al. ex.* ⅛ inch. Coll. Mr. Wm. Saunde London, Ont. (Belongs to *Metallosetia*, Steph.)

[Basal joint of the antennae thickened with scales; palpi tufted.]

C. lineapulvella. N. sp.

White, faintly tinged with ochreous yellow; dorsal margin and ap of the primaries more distinctly yellowish; two rather indistinct ochreo yellow lines begin before the middle of the wing and pass back, one t the apex and one to the dorsal margin before the apex, the apical lir giving off a faint branch to the costal margin. Ciliae pale ochreous; t entire wing, except near the base, dusted with dark brown specks, whic are arranged in lines more or less parallel to each other; antenn annulate with ochreous yellow. *Al. ex.* 5 lines. Kentucky. Taken the lamp.

I have taken on the wing many other species, but I refrain fro describing them until their food plants are known, a plan which I ha perhaps also better have adopted with some of the above, for many of t species of this genus resemble each other so closely that it is well nig impossible to give written descriptions by which they can be identified.

Signs Used to Denote Sex.—I have often been puzzled to accou for the origin of the signs in use among naturalists to denote the male (♂) and the female (♀) sexes; but the other day, while reading an astronomic paper, I came across a fact which seems to offer a solution of the difficult It appears that the first sign (♂) has been used from remote antiquity t signify the planet Mars, and is a rude representation of a spear behind shield, fit emblems of the God of War. Ceres, the goddess of corn, w similarly symbolized by the sign used in zoology to denote the female se with this slight difference, that in the original astronomical sign, the co tinuity of the circle is broken on the left side, so that the figure appropriatel represents a sickle.—*E. C. Lefroy in Hardwicke's Science Gossip.*

ON TWO SPECIES OF AGROTIS, ALLIED TO A. TRIANGULUM.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

Among the material submitted to me for determination by Professor Packard, from the Peabody Academy of Science, are specimens from Maine and Massachusetts of two species of *Agrotis* allied to, but distinct from *A. triangulum.*

Agrotis attentus. N. sp.

The eyes are naked. The middle and hind tibiae are armed, but the fore tibiae are without spines; male antennae simple, bristled and pubescent. Fore wings pulverulent brown, paler over the costal region, on which the inception of the geminate lines are marked in dark brown. There is a narrow deep brown basal ray extending to the dentate indistinct t. a. line. Disc not suffused with darker brown between the ordinary spots, which are moderate, pale, with fine dark annuli. Orbicular *spherical*, complete, not pointed inferiorly, as in *triangulum.* T. p. line with its pale centre alone perceivable, denticulated, notched opposite the cell. The subterminal space is not differentiated by any darker tint; the subterminal line is pale, preceded at costa by a very slightly darker brown shade, not always noticeable, and not at all like the determinate mark of *triangulum.* Male hind wings almost whitish; female darker. Thorax and head like fore wings. Beneath the fore wings are brown, with the exterior line indicated; hind wings with brown costal region, else pale, with faint discal spot and a double subterminal line marked on the costal region. Maine; two specimens; expanse, 36 m. m.

Agrotis perattentus. N. sp.

Eyes naked; fore tibiae unarmed, middle and hind tibiae spinose; male antennae simple, bristled and pubescent. Color of *A. attentus*, but brighter, rosy brown and more like *triangulum*, on account of the discal field before the orbicular and between the spots being suffused with dark brown shading. Orbicular spherical, pale; claviform indicated in outline; a deep brown shading accompanies the basal dash. Reniform large and wider than in *triangulum.* Ordinary lines distinct, geminate, dark brown; t. p. line with its inner line distinct, lunulate; its outer line lost

against the darker brown subterminal space, which is differentiated by i deeper color and which it inwardly limits. Subterminal line indicated l the difference in color between the subterminal and terminal spaces, t latter concolorous with the rest of the wing. Hind wings pale testaceo fuscous in ♂, more fuscous in ♀. Beneath a common fuscous line a dots; the tint is testaceous, with fuscous powdering; fore wings t darker, with ruddy costal edge. Mass.; Me.; expanse, 32 to 36 m. m.

Both these species are slighter bodied than the European *A. t angulum*, and differ in ornamentation by the shape of the ordinary spo the conformation of the t. p. line, and the pallor of the hind wings.

Mamestra renigera (Steph.)

This species, referred in my "List" to *Hadena* (p. 16), belongs *Mamestra*, and should be interpolated on page 13 l. c., between *cinnabarina* and *M. laudabilis.*

NOTES ON THE LARVA OF LEUCANIA PSEUDARGYRIA GUENEE.

BY F. B. CAULFIELD, MONTREAL, P. Q.

On April 18th of this season, while searching for insects on Montre Mountain, I found under a stone at the foot of a hickory tree, a larva, which the following is a description:

Length two inches. Form cylindrical, slightly annulated. He reddish yellow, with two brown streaks, and marbled with lines and dc of the same color; semi-transparent, shiny, slightly bilobed, with a fe scattered hairs of a whitish brown color. Mandibles brown.

Body above dirty greenish grey, with darker spots and blotches, faint white dorsal line, and another of the same color a little above tl spiracles; sides light greenish grey, minutely spotted with brown, with few scattered hairs of a brown color, tipped with yellowish white. Unde surface, feet and prolegs very light greenish grey.

I placed this larva in a box with some earth, but owing to the backwar ness of the season I could not find any food for it. It went under tl earth on April 21st, and turned to a chrysalis on April 23rd. The ima emerged on May 20th, and proved to be *Leucania pseudargyria*, Guen.

That this larva hybernated there can be no doubt, and I believe, as rule, that those larvæ which lie dormant during the winter, when spri

comes, feed again for a short time before changing to chrysalis, but this instance proves that food is not always necessary to them after they have hybernated, as there was not even a bud to be seen when I found it. Of course under its natural conditions it would have partaken of some food as soon as vegetation appeared, otherwise it would have pupated in the autumn. This deviation from the usual habit may be attributed to its changed conditions, the warmth of the house hastening its transformations.

FIRST ANNUAL REPORT OF THE COUNCIL OF THE MONTREAL BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

During the summer of 1873 a fortunate circumstance occurred to which this Branch owes its origin. The following gentlemen, viz., Wm. Couper, F. B. Caulfield, Wm. Hibbins, C. W. Pearson and G. B. Pearson, met by chance on the Montreal Mountain, where the subject was discussed, and it was then decided to hold a meeting at the residence of Mr. Caulfield, in order to make further arrangements for its formation. This meeting was held on the 30th of August, when it was resolved to form a branch in connection with the Entomological Society of Ontario, and the Secretary *pro. tem.* was instructed to write to the parent society, asking permission to form a Branch Society in this city. This proposition was at once accepted by the parent Society.

On the 16th of October the following officers were elected for the ensuing year :—William Couper, President ; M. Kollmar, Vice-President ; F. B. Caulfield, Secretary-Treasurer ; Council—G. J. Bowles, P. Knetzing and C. W. Pearson ; Curator, William Hibbins.

By-Laws were framed for the guidance of the Branch, which were approved by the parent Society. Our monthly meetings have been regularly held and well attended, and your Council congratulate the Society on the benefits derived. During the eight meetings which have been held, independent of the production of original communications on Entomology, there were remarkably good exhibitions of insects, which also tended to give additional information to members.

The first meeting of the Branch in August, 1873, consisted of se members, and since then five additional members have been elected.

The following papers were read during the winter months :

"A Dissertation on Northern Butterflies," by William Couper; " the Cicindelidae Occurring on the Island of Montreal," by F. B. Caulfie " On Some of the Benefits Derived from Insects," by F. B. Caulfield.

The following works have been donated during the year :

" On Some Remarkable Forms of Animal Life from the Great De of the Norwegian Coast," by G. O. Sars, 1 vol.; " On Norweg Crustaceans," by G. O. Sars, 2 vols.; "Synopsis of the Acrididae North America," by Cyrus Thomas, 1 vol.

Your Council would suggest that the Curator procure store boxes the preservation of the specimens obtained for the Society during approaching season. In this way the nucleus of a collection can formed prior to the purchase of a cabinet, which your Council trusts Society will be possessed of before next winter.

Your Council would also suggest that members carry note-boo wherein to record Entomological observations, especially relative insects injurious to the crops; also of such species as are consider beneficial in checking the progress of destructive insects. As this is c of the principal objects of the Society, field notes of this nature a always valuable, and should form subjects of investigation and discussi at our meetings. Attention should be given to the larval forms of insec as this is a specialty of Entomology from which much knowledge is yet be obtained.

Your Council strongly impress on the members to use their influen in promoting a knowledge of the importance of the study of Entomolog more especially with agriculturists and horticulturists, in order to enab them to check the ravages of the numerous insects injurious to veg tation.

All of which is respectfully submitted.

WM. COUPER, Chairman.

C. W. PEARSON,
GEO. JNO. BOWLES.

NOTES ON THE SPECIES OF OODII OF LOUISIANA.

BY S. V. SUMMERS, M. D., NEW ORLEANS, LA.

The species belonging to this sub-tribe, although small in number, rank with the rarer forms of Carabidæ ; they may easily he known by their glabrous body and the confluent eighth and ninth striæ of the elytra. Several of the Oodii bear a superficial resemblance to certain *Amara* allied to *fallax*. With one exception *(O. elegans)* the species are all Atlantic, occurring more abundantly southward. *Oodes fluvialis* must be considered a typical northern species, occurring rarely near St. Louis, Mo., but more abundant at Rock Island, Ill. *O. elegans* has occurred with Dr. Le Conte along the Gila River, in Arizona. We may expect additional species from the Southern Pacific region and the western source of the Rio Grande.

Lachnocrepis parallelus (Say).

A single ♂ specimen taken in November, under a partially submerged log on the Jackson R. R., near New Orleans. Dr. Horn gives the length 0.42 inch (Trans. Am. Ent. Soc., v. 3, p. 106) ; my specimen measures 0.44 inch long. Color black, somewhat shiny ; basal angles of thorax reddish brown. I have not been able to find this species in any of the New Orleans collections. I have seen one in Mr. Trabrandt's cabinet, from Mexico, near the Rio Grande.

Anatrichis minuta (Dej.)

Our smallest Oodii ; length, 0.20–0.25 inch. Rather rare. Specimens taken adhering to under surface of logs near streams, and on sifting mud from roots of plants over water. This species seems not to have occurred in Louisiana collections before last winter.

Oodes amaroides (Dej.)

Length, 0.34-0.40 inch. More than twenty specimens taken in galleries under logs, in very damp or muddy places. The species of the sub-genus *Oodes* (Chaudoir), have the ability to remain under water for nearly an hour at a time, and are seldom found running on the ground.

Oodes Americanus (Dej.)

Length, 0.58 inch. A single ♂ taken under a rail on the Ponchartrain R. R. Several others occur with Mr. Trabrandt. Our largest and rarest

species; none of my *fluvialis* measure over 0.52 inch. Dr. Horn give this and the preceding species as 0.50 inch long *(ante.)*

Oodes cupræus (Chaud.)

Several specimens taken by Mr. Trabrandt. I have found this specie pretty common near St. Louis, Mo., on baling water over mud flats. The take flight very readily, and may be found running on the ground on warm days, but I have never been able to find them or *Lecontei* remain unde water longer than most Carabidæ. The La. specimen before me is greatl mutilated, and I am reluctant to give its measurement. The Missou species give 0.40 inch long.

Oodes Lecontei (Chaud.)

Length, ♂,0.36 inch; ♀,0.40 inch. Not rare. Many specimens take under logs near water on bailing near the shore; also running on the groun in July and August. It is a more robust species than *cupraeus*, less shinin and with punctured striæ. A single specimen taken somewhere on th coast of Miss., during the stoppage of steamer to "wood up," in June.

Oodes 14-striatus (Chaud.)

Length, 0.42–0.47 inch. Common everywhere near N. O. during th summer; found under logs and running on the ground near water, an frequently under loose bark in the woods. The specimens have decidedly greenish tinge when alive. They are not as active as the Oode and Stenous groups. Mr. Trabrandt informs me that they do not occu abundantly every year. They are also found in Texas and Mexico.

Oodes texanus, Lec.

Length, 0.42 inch—♂. A single specimen taken by C. Trabrand while collecting together, and given me as a *14-striatus*, from which it is a once distinguished by the punctured striæ. The specimen occurred unde some rail-road ties on the Ponchartrain R. R., on high ground, not nea water. Dilligent search has sinced failed to discover others.

Evolenes impressus, Lec.

Length, 0.37 inch—♀. A single specimen taken near New Orlean and given me by Mr. Em. Trochammur. This is the rarest Oodii occurrin in La. Any enlargement on descriptions of species would seem out o place, but would refer all to Dr. Horn's admirable and complete synopsi in Trans. Am. Ent. Soc., Vol. 3, No. 2, 1870.

Crinus scrophulariæ, Auct.

A unique of this European Curculio was taken on wood wharf, June 30th. There can be little doubt of the correctness of this determination. My specimen is 0.16 inch long (exclusive of rostrum). Body black. Rostrum shorter than thorax, slightly arcuate; antennæ inserted about two thirds from tip, piceous; club somewhat paler. Thorax much narrower than base of elytra, covered with dense prostrate yellowish hairs, and with an elevated transverse ridge at middle; elytra somewhat triangular, blackish, coarsely punctured and with four black longitudinal vittæ, dotted with whitish. A rather large, oblong, dense black spot, margined posteriorly with whitish hairs, placed on the suture, near the scutellum, and a similar but smaller spot at apex. Legs blackish, more or less speckled with whitish hairs.

ANTICOSTI COLEOPTERA.

COLLECTED ON THE ISLAND IN 1873, BY WM. COUPER, MONTREAL.

(As determined by J. L. Leconte, M. D.)

Notiophilus sibiricus, *Motsch.*
Carabus palustris, *Fischer.*
" lapilayi, *Laporte.*
Calathus ingratus, *Dej.*
" confusus, *Lec.*
Pterostichus coracinus, *Lec.*
" luczotii, *Lec.*
Harpalus pleuriticus, *Kirby.*
Boletobius pygmaeus, *Mann.*
Creophilus villosus, *Kirby.*
Anthobium dimidiatum, *Mels.*
Necrophorus vespilloides, *Herbst.*
" mortuorum (pygmaeus), *Kirby.*
Hydnobius substriatus, *Lec.*
Epuraea boreella, *Er.*
Omosita colon, *Er.*
Byrrhus americanus, *Lec.*
Heterocerus substriatus, *Kies.*
Aphodius fimetarius, *Ill.*
" ruricola, *Mels.*
" granarius, var. spretus, *Hald.*
Chrysobothris trinervia, *Lec.*
Elater mixtus, *Lec.*
Agriotes fucosus, *Lec.*
Limonius quercinus, *Dej.*
Sericosomus incongruus, *Lec.*
Corymbites resplendens, *Esch.*
" aeneicollis (Kendalli), *Kirby.*
" spinosus, *Lec.*
" aratus, *Lec.*
Eros coccinatus, *Say.*
Podabrus basillaris, *Say.*
" laevicollis, *Kirby.*
Telephorus fraxini, *Say.*
Dolichosoma foveicollis, *Kirby.*
Hadrobregmus foveatus, *Kirby.*
Spondylus upiformis, *Mann.*
Criocephalus agrestis, *Kirby.*
Pachyta monticola, *Rand.*
Acmaeops pratensis (strigilata.)
Leptura pedalis.
Donacia emarginata, *Kirby.*
Syneta tripla, *Say.*

Pachybrachis atomarius, *Mels.*
Bromius vitis, *Fabr.*
Anaspis rufa, *Say.*
Hylobius pinicola, *Couper.*
Dryocaetus septentrionis, *Hbst.*
Dendroctonus rufipennis.
Amara, not determined.
Cyphon, indeterminate.
Graptodera, not named.
Ceutorhynchus, not determined.

ON SOME OF OUR COMMON INSECTS.

17.—THE CURRANT GEOMETER OR MEASURING WORM —Ellopia (abraxis) ribearia, Fitch.

BY THE EDITOR.

This insect is now becoming very abundant in most parts of Ontario and is a very troublesome pest. Its peculiar mode of progression will enable one to readily distinguish it from the common Saw-fly caterpillar, for, having its feet placed at each extremity, it arches its body into a sort of loop at every step, and is hence popularly called a measuring worm or span worm.

Fig. 22 (after Riley) shows this caterpillar in various attitudes. At 2 it is represented hanging from a silken thread which it has the power of spinning at will, and by means of which it is enabled to lower itself suddenly from the bush when danger threatens, and remains suspended in mid air until it can safely return to its former position. When full grown, it measures an inch or a little more in length. Its head is of a medium size, white, bilobed with a large round black spot on the upper part of each lobe, a short black stripe across the front, a little above the mouth, with a small spot of the same color on each side of it; there are also a few short black hairs scattered over its surface; jaws black. The body above is whitish, with a number of black spots of different sizes on each ring or segment; there

Fig. 22.

is a wide yellow stripe down the back, and another of the same character along each side, but somewhat broken. The under side is white, with a slight tinge of pink, and also spotted with black, with a wide yellow stripe down the middle. The feet are blackish; prolegs yellow, dotted with black.

When full grown, the larva descends to the earth and buries itself a little below the surface, where it is transformed into a dark brown chrysalis about half an inch long, and remains in this inactive state from two to three weeks.

The moth, see fig. 23 (after Riley), is of a pale yellowish color, with several dusky spots varying in size, form and distinctness in different specimens; sometimes they are so arranged as to form one or two irregular bands across the wings; when these latter are expanded they measure about 1¼ inches. Soon after the moths escape they pair and shortly the female deposits her eggs on the twigs and branches of the gooseberry and currant bushes, where it is said they remain unchanged until the following spring.

Fig. 23.

This insect is a native of America, and was formerly confined to the wild gooseberry and currant bushes, on which we still occasionally see them. The larvae are found in various stages of their growth, from the 1st to about the 20th of June, and will feed on the black currant as well as on the red and white currant and gooseberry. The moths begin to appear during the first days of July, and are very common for two or three weeks following.

Powdered hellebore mixed with water and used with a watering pot, or Paris green mixed with twenty times its weight of flour and dusted on the bushes, will be found effectual remedies for the destruction of this caterpillar. The habit it has of letting itself down from the bush with a silken thread, and remaining suspended, may also be turned to practical account in its capture, for if, after tapping the infested bushes, a forked stick or some similar instrument is passed under it, all the hanging threads may be caught and the larvae drawn out in groups and crushed with the foot.

EDITORIAL SUMMARY.

We have been kindly favored with a copy of the "Sixth Annual Repo on the Noxious, Beneficial and Other Insects of the State of Missouri," b C. V. Riley, State Entomologist, 8vo., pp. 160, with 55 illustrations. Bot entomologists and agriculturists are laid under lasting obligations to M Riley for these excellent yearly reports on the life history and depredation of many of our insects. The present Report opens with "Notes of th Year," under which heading there are given some practical observation on the Codling Moth, the Colorado Potato Beetle and the Cotton Worm Next follows a lengthy and exhaustive chapter of 56 pages on the Grap Phylloxera, in which is brought together in a consecutive form all th facts hitherto published in reference to this interesting insect. The Blu Caterpillars of the Vine then claim attention, each species being nicel illustrated. Detailed accounts are given also of Ham Beetles, the Clove Worm, the legged Maple Borer, the Raspberry Root Borer, the Norther Brenthian and the Jumping Sumach Beetle. A chapter on Beneficia Insects is next in order, in which the life history of a parasite on th common white grub is detailed. Then follow observations on th Dominican Case Bearer, the Yucca Moth, Hackberry Butterflies, closin with an interesting chapter on the Katydids. Mr. Riley seems admirabl adapted to fill the position in which he has been placed, and we sincerel hope he may long be spared to prosecute the work he loves so well.

INTERESTING CAPTURES.—Mr. F. C. Lowe, of Dunnville, has recentl been on a collecting tour in the county of Essex, and we have bee favored with a sight of some of his captures. Among the more interestin insects secured, we would especially mention a very handsome and perfec specimen of *Papilio marcellus*, with the ground color an unusually fin pale green. Mr. Lowe saw three of these insects on the wing in th neighborhood of North Ridge, about four miles from Essex Centre, o the Canada Southern R. R, but only succeeded in capturing one of them *Papilio thoas*—several taken. This insect was quite common in almos every clover field in that neighborhood. Mr. Lowe took two specimen of *thoas* last season on the River St. Clair, near Port Lambton. *Thyreu nessus* also common in clover fields; *Hesp. oileus*, several specimens; als the following, all captured between the 10th and 20th June: *Erebi nephele*, common; *Eudamus tityrus*, common; *Papilio turnus* and *P troilus; Nisoniades catullus*, not rare; *M. tharos*, common; *P. Americana* common; *Hesp. bathyllus*, rather plentiful; *Hesp. zabulon*, very common *Nisoniades persius*, *Trichius bidens* and *Desmocerus palliatus*.

The Canadian Entomologist.

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ON SOME OF OUR COMMON INSECTS.

18.—THE SPOTTED PELIDNOTA—Pelidnota punctata, Linn.

BY THE EDITOR.

This large and handsome beetle is an enemy to the grape vine. It attacks the foliage, eating numerous holes in the leaves, and sometimes when the beetles are abundant, completely riddling them. Damage from this cause to any great extent is however, fortunately of rare occurrence; in most instances the beetles are not numerous, but even where only occasionally met with, their size and beauty will always attract notice.

Fig. 24.

In the accompanying figure 24 (after Riley) this insect is shown in its three stages of larva (*a*), chrysalis (*b*), and beetle (*c*); it is in the latter state only that it is injurious to the vine.

The beetle measures about one inch in length, and half an inch in width at its widest part, is nearly oval in form and of a dull reddish yellow color, with a polished surface. The thorax, which is slightly darker than the wing covers, has a small black spot on each side, and there are three larger ones on each wing case. The jaws and posterior part of the head are both black; so also is the scutellum, which is a small, nearly triangular piece placed near the centre above, just where the two anterior edges of

the wing cases join the thorax. The transparent gauzy wings, which concealed when not in flight under the wing cases, are dark brown. T under side of the beetle is of a dark green shade, with a metallic lus and downy about the middle, with fine brownish hairs; legs dark shin green.

It appears with us during July and August, and is moderately act during the day time, flying about from vine to vine with a heavy awkw flight and loud buzzing noise. After pairing, the female deposits eggs in rotten wood, on which the grub, when hatched, feeds; the decay stumps and exposed roots of different trees are usually selected for t purpose. Mr. Riley, of St. Louis, Mo., was the first to describe t larva, and we quote his description as given in the *American Entom gist*, vol. 2, p. 295:

"It is a large, clumsy grub, bearing a close resemblance to t common white grub of our meadows, and differs from that spec principally in having the skin more polished and of a purer white col and in the distinct heart-shaped swelling above the anus, fig. 24, Towards the latter part of June we have found this larva (fig. 24, *a*), common with the pupa (*b*), in rotten stumps and roots of the pear. preparing for the pupa state the larva forms a rather unsubstantial coco of its own excrement, mixed with the surrounding wood. The pu state lasts but from eight to ten days, and the beetle (*c*) is found on t vines during the months of July, August and September. It is not known how long a time is required for the developement of the larva, l from analogy we may infer that the insect lives in that state upwards three years."

In the figure, *e* shows the antenna of the larva, and *f* one of the le —both magnified.

This insect in our Domtnion is confined mainly to the province Ontario, and prevails most in the western section. We are not aware its having been found at all in Quebec. It is common in most of t Western and Eastern States. Should it become sufficiently numerous any section to excite alarm, it may readily be checked by hand pickin the insect being heavy and clumsy in its movements, may be eas captured and destroyed.

THE LINNEAN SIGNIFICATION OF THE GENERIC TERM PAPILIO.

BY SAMUEL H. SCUDDER, CAMBRIDGE, MASS.

Perhaps no part of my "Systematic Revision of Some of the American Butterflies" has been more severely criticized than the restoration of the Linnean name Papilio to one of the nymphalideous butterflies, Antiopa. The principal objection made to this change, besides the fact that it runs counter to the current of modern usage, being that it violates the idea of the genus as it lay in the mind of its founder. The attention of those interested is called to the following historical facts, not given in the Revision.

The name Papilio was established by Linné in the first edition of his Systema Naturæ, in 1735*, where the following division occurs:

ANGIOPTERA.

Alae omnibus datæ, elytris destitutæ.

PAPILIO.	Rostrum spirale, alae 4.	Papilio alis erectis. Psyche alis planis. Phalaena alis compressis.

Here the typical Papiliones are the butterflies in general. The succeeding genera of Angioptera are *Libellula*, *Ephemera*, *Hemerobius*, *Panorpa*, *Raphidia*, *Apis*, *Ichneumon* and *Musca*.

In the second edition of the same work (1740) we find the following on p. 60:

153. PAPILIO. *Cauda simplex, alae* iv. *Rostrum spirale seu nullum.*

Pap. antennis clavatis, pedibus 4.
" " " 6, alis erectis angulatis.
" " " 6, " rotundatis.
" " " 6, alis patentibus.
" " " 6, alis reflexis.

Pap. ore spirale, antennis subulatis.
" " " barbatis.
" nullo, " subulatis.
" " " barbatis.

* I have only been able to consult Fee's reprint, Paris, 1830, p. 76.

The butterflies with aborted front legs (*i. e.*, Nymphales) are placed at the head of the series.

The third edition (1740) was but a reprint of the first, for Ger students.

The following arrangement occurs on p. 94 of the fourth edi (1744.):

160. PAPILIO. *Antennæ clavatæ.*

P. pedibus 4.		le Papillon.
" 6, alis erectis angulatis.		
" 6, " rotundatis.		
" 6, alis patentibus.		
" 6, alis reflexis.		

Here Papilio is still further restricted, always in the direction of butterflies, and those with atrophied front legs are still at the head of series.

In the year 1746 the first edition of the Fauna Suecica was publisl in which Linné for the first time treats of species, giving to them na in the language of the country. The butterflies are found on pp. 2 248, and are divided into two groups, as follows:

[232.]* Pedibus quaternis unguiculatis.
[240.]** Pedibus sex unguiculatis.

The so-called tetrapods still at the summit. The species are numbe from 772 to 807; the species afterwards named *antiopa* is No. 772; called *machaon*, No. 791.

In the fifth edition of the Systema Naturæ (1747), under Gymnapt p. 68, is an exact repetition of what is found in the second edition.

The sixth edition (1748) contains the following on p. 63:

185. PAPILIO. *Antennæ clavatæ.*

1. Papilio pedibus 4, alis erectis angulatis.	morio Fn. 772.
	polychloros Fn. 773.
	urticana Fn. 774.
	C. duplex Fn. 775.
	oculis pavonis Fn. 77
	ammiralis Fn. 777.
	belladonna Fn. 778.

2.	Papilio pedibus 4, alis erectis rotundatis.	imperator Fn. 779. comes Fn. 783.
3.	Papilio pedibus 6, alis erectis angulatis.	regina Fn. 791. canicularis Fn. 795.
4.	Papilio pedibus 6, alis erectis rotundatis.	brassicaria Fn. 799. aurora Fn. 801. alpicola Fn. 802. argus Fn. 803–806. butyracea Fn. 807, 808.

Here not only are the four-footed butterflies placed first, but, as in the Fauna Suecica, "*morio*" *(i. e., antiopa)* heads the list, followed directly by the butterflies most closely allied to it—*polychloros, urticæ, c-album, io, atalanta* and *cardui*, in the same order as they occur in the Fauna Suecica, to which the numbers on the right refer.

In the seventh edition (1748), exactly the same is found on p. 63.

The eighth edition contains no animals.

In the ninth edition (1756) we find precisely the same as in the sixth excepting in the first line, which reads, p. 69 :

196. PAPILIO. *Antennæ clavatæ.* le Papillon.

Not until the tenth edition (1758) of his great work, did Linné place the "swallow-tails" at the head of the genus Papilio, in the order too well known to require repetition here. In view of these facts, it is worth enquiring: In Linné's mind, which was a *typical* Papilio—Antiopa or Machaon? and was there, or was there not, any reason for specially selecting Antiopa as the type of Papilio, when it was found, in 1872, that by Schrank's first limitation of the genus, in 1801, it must be applied to some one of the Nymphales?

ENTOMOLOGICAL NOTES.

BY W. V. ANDREWS, NEW YORK.

Mr. J. E. Fletcher has a note in the March No. of *Newman's Entomologist*, on "Controlling Sex in Lepidoptera." He says: "During last summer, I had a few larvæ of *Exapate congelatella* feeding on privet; as I was greatly occupied with other things, they were neglected; the supply

of food was very irregularly given and short in quantity, yet the moth produced from them consisted of four males, full sized, and eleven females, some of these latter being much below the average of the species in size."

I presume that the reason Mr. Fletcher supposed that the result might have been very different was because he had read in "Newman" the result of an experiment performed by an American lady, I think Mrs. Treat, who, having underfed a lot of larvæ, succeeded in producing all males, the inference drawn being that males were simply underfed females. I wrote some notes on this subject for "Newman," thinking that Mrs. Treat's paper had appeared originally in that publication. It seems, however, that it did not, and I now reproduce the substance of those notes here, as more likely to meet the eyes of all concerned.

First, then, I would remark that this clearly is not Nature's method of "controlling sex." If a batch of larvæ, say of *V. antiopa*, all feed on the same elm, there will be produced both males and females, although the feeding must be alike for all. But there is an excellent opportunity afforded Mrs. Treat of testing the value of her theory, by the larva of *Thyreus Abbottii* (Swains.) It is well known that the male larva of this species is altogether different in color from that of the female, so the sexes are easily distinguished.

Now, if Mrs. Treat will take the female larvæ, and by underfeeding *produce male imagines*, the thing will be more satisfactory. I am not unaware that in Hymenoptera food is said to have a good deal to do with the production of sex, but still Mrs. Treat's experiment cannot be considered as conclusive.

Hasty generalization is a fault to which we are very liable, and doubtless the ambition to discover a new law is very laudable. A case of this nature occurs in your No. 5, vol. 6. In a paper appearing in this number, Mr. Gentry, of Germantown, fancies he has discovered the law which produces difference of color in caterpillars of the same species. Now, to be of any value, this law must be universal, and the facts of the case do not show any such universality. Mr. Gentry thinks that the difference in color and markings where this occurs is attributable to the difference in the chemical constituents of the food plant at different seasons of the year. He selects as one instance the larva of *Eacles imperialis*, and gives, correctly enough, three varieties of color. But unfortunately, these varieties occur at one part of the season as well as

another, and the varieties may be found feeding on the same tree. How, then, can the food have anything to do with the variation? *Eacles imperialis* is single brooded with us, but still the larva is found in August as well as in October, and no difference in color is observable at one time more than another. In a previous number I related an experiment made with a brood of *imperialis*, and, in that case, every one of the larvae were dark.

The chemistry of biology is doubtless a very abstruse subject, but it is well worth any labor that may be bestowed on its investigation. The larva of *A. luna* feeding, say, on Sweet Gum, produces an insect of a beautiful green color. That of *Eacles imperialis*, feeding on the same food, produces an insect of which yellow and purple are the predominant colors, while that of *regalis* produces an imago yellow and red. Here are larvae all similarly constituted as regards masticatory and digestive powers, and the substance acted upon is the same in each case, and yet how different is the result. This is very wonderful. What is there in the constitution of the digestive organs of these respective larvae that enables one to eliminate this color, and another that? Of course similar results may be observed in other animals, and the same beefsteak may contribute to the growth of a negro as well as of a white man, but still this does not diminish the difficulty we have in understanding how it is done. Entomology is a fascinating pursuit, looked at as merely an amusement, but I have an abiding faith that it is destined to throw more light on the phenomena of life than perhaps any other branch of science can. But we must avoid hasty conclusions.

I have selected only one instance from Mr. Gentry's paper, but there are others. For example, the same objections may be made in the case of *Sphinx 5-maculata* as are made in that of *imperialis*. The different colors appear at the same season, and may be found feeding on the same tomato plant.

ON THE LARVA OF CATOCALA ULTRONIA, Hubn.

BY THE EDITOR.

For several years past, while jarring our plum trees for Curculio in June, we have taken the larva of a Catocala usually less than half grown, but have never succeeded in rearing any of them until this season, when

from three larvæ taken on the 16th of June, one has been successfully brought through its various stages, and proves to be *ultronia*.

The following description was taken at the time of its capture, when it was nearly full grown.

Length 1-60 inches, onisciform.

Head medium sized, flattened in front, slightly bilobed, dull bluish grey, with the front flattened portion margined with a purplish-black stripe. Under a lens the surface appears thickly dotted with pale and dark colored dots and streaks, with a few short, pale, scattered hairs.

Body above dark dull grayish brown, appearing under a magnifying power thickly studded with brownish dots on a paler ground. Second segment a little paler than the others. A sub-dorsal row of dull reddish tubercles, one on each segment from second to fourth inclusive, but behind this there are two on each ring to the twelfth segment inclusive, the anterior one being the smallest, while the posterior and largest tubercle is more decidedly red, all encircled with a slight ring of black at their base. On the ninth segment above there is a prominent, nearly upright stout, fleshy horn, about one-twelfth of an inch long, pointed and similar in color to the body, but with an irregular grayish patch at each side. On the twelfth segment the two hinder tubercles are somewhat increased in size and united by a low ridge, tinted behind with deep reddish brown; there is also an oblique stripe of the same color extending forward from the base of the tubercles to near the spiracle on this segment. The terminal segment is flattened and has a number of small pale reddish and blackish tubercles scattered over its surface. In front of each of the smaller sub-dorsal tubercles, from fifth to twelfth segments inclusive, there is a dull white dot, and one also of a similar character in front of each of the spiracles along the middle segments of the body; from each of the tubercles throughout there arises a single dark short hair. Spiracles large, oval, dull grayish, faintly encircled with black. Along the sides of the body, close to the under surface, is a thick fringe of short, fleshy looking hairs of a delicate pink color.

The under surface is also of a delicate pink, of a deeper shade along the middle, becoming bluish towards the margins, with a central row of nearly round, velvetty black spots, which are largest from the seventh to the eleventh segments, inclusive. The anterior segments are greenish white, tinted with rosy pink along the middle, with a dull reddish spot at

the base and behind each pair of feet. Feet pale greenish, spotted outside and tipped with black; prolegs dull greyish brown, margined with black.

This larva became a pupa on the 21st of June, and remained in this state for twenty-four days, producing the imago on the 15th of July.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 130.)

ASPIDISCA.

For the purpose of comparing it with the other species, I quote here Dr. Clemens' description of

A. splendoriferella.

"Head golden; antennæ fuscous, tinged with golden. Fore wings from the base to the middle leaden grey, with a splendant lustre, and from the middle to the tip golden, with a broad, nearly straight, metallic, silvery streak, extending from the costa, near the tip, to the middle of the wing, and dark margined on both sides. This is nearly joined by a dorsal streak of the same hue, almost opposite to it, with converging dark margins, and with a blotch of dark brown scales adjoining it behind. In the costo-apical cilia is a short, blackish brown streak, parallel to the dark margin of the silvery costal streak. At the tip is a black, apical spot, with metallic, silvery scales in its centre, and a few silvery scales in the ciliae above and beneath it. A blackish brown hinder marginal line in the ciliae, interrupted by a silvery streak in the ciliae beneath the apical spot, and the ciliae yellowish brown. Hind wings leaden gray, and the ciliae yellowish brown."

There is a straight black streak in the ciliae, from the apical spot to the apex, not mentioned by Dr. Clemens.

Alar ex. 2 lines or less. I have made some other observations on in its various stages, vol. 3, ante p. 223. As there stated, it mines t leaves not only of the Apple, in which Dr. Clemens found it, but al those of the Haw *(Cratægus)*, Pear *(Pyrus)*, Wild Cherry *(Prun serotina)*, and since then I have found it mining the leaves of the Quin *(Cydonia)*. All of these trees (except, perhaps, the Wild Cherry) are nearly related that it is not surprising to find in the leaves of any one them any larva which mines the leaves of another, and the Wild Cher is such a favorite food with the larvæ of Lepidoptera, that it is n surprising to find any larva feeding on it which is not exclusively attach to some single species. Thus an *Ornix*, which mines Apple leaves, al mines those of the Wild Cherry. *Tischeria malifoliella* Clem., a *Lithocolletis cratægella* also both mine the leaves of all the above nam trees except, *perhaps*, the Pear and the Quince. The fact that *splendoriferella* mines the leaves of the trees named, affords no presumpti then that it is a general feeder, or that it mines the leaves of any t not closely allied to the Haw.

I make these suggestions because Mr, Stainton, in the preface to h very valuable addition of the writings of Dr. Clemens (for publishi which he has the hearty thanks of every student of the American Micro states that he has bred from Aspen leaves, from Oregon, a species whi it would be very hard to distinguish from *A. splendoriferella*. But becau of the difference in the food plants, Mr. Stainton (rightly, I thin considers it a different species. If the vignette upon the title page Mr. Stainton's edition, above named, is, as I suppose, intended represent the mined Aspen leaf, I think it establishes the specific charact of the Aspen species. The hole left in the Aspen (judging from t vignette) is very nearly an ellipse. That made by *A. splendoriferella* much wider in proportion to its length, being nearly as wide as long, a the case is almost angulated at the sides. The mines of the Micr Lepidoptera, and the larval cases of the case-bearing species, and t modes of pupation, and forms and colors of their cocoons and pupa case have specific characters as distinct as the galls made by the *Cynipid* The color of a pupa case, cut from a leaf, depends, for instance, not on on that of the leaf, but of the silk with which it is lined and the color the enclosed larva and pupa. But I have never been able to detect difference between the pupa cases of *A. splendoriferella* from any of t leaves mined by it, as above stated. See remarks under the ne species.

A. juglandiella. N. sp.

Except that it is *perhaps* a trifle smaller, I can not distinguish this species in the imago from *A. splendoriferella.* Nevertheless, I consider it a distinct species. The pupa case is oblong oval, much narrower in proportion to its length, and smaller in every way than that of *A. splendoriferella,* besides being more pointed at the end by which it is attached. Besides, although *splendoriferella* is much the most common species (at least 1000 mines of *splendoriferella* being found to a single one of *juglandiella*), yet I have never met with a mine of the former earlier than the latter part of July, whilst the mines of the latter are as abnndant, or nearly so, in the latter part of May as at any time. The first mines of *juglandiella* that I discovered were in the leaves of a small Walnut tree, which stands under a large Wild Cherry tree. It was early in June. I found several mines, but they were not by any means abundant. Not a mine could I find on the Wild Cherry, either at that time or for two months afterwards. *Juglandiella* continued to mine the leaves of the Walnut throughout the season, but never became abundant. But from the latter part of July, on through the season, the mines of *splendoriferella* were abundant, not only in the leaves of that particular Wild Cherry tree, but in those of all the species mined by it, and by October the leaves were riddled with the holes left by cutting out the cases. The pupa case of *splendoriferella* is much larger than that of *juglandiella,* though there is no appreciable difference in the size of the insects. The former is dark yellowish, while the latter is brown. I have taken the latter species mining Walnut leaves at a great distance from any Wild Cherry trees, as well as close to them. (See also the remarks under *A. splendoriferella.*)

A. saliciella. N. sp.

Silvery. Antennæ faintly tinged with fuscous. There is a triangular white costal spot before the ciliæ, and an opposite dorsal one, each dark margined before and behind; *the space between these two streaks and behind them to the apical spot is silvery.* There is a golden yellow patch on the end of the disc immediately before the space, between the two streaks above mentioned (the costal and dorsal white streaks). Another golden yellow patch behind the costal streak, on the margin, with a very indistinct and small black costal streak in it; another golden yellow patch on the dorsal margin, behind the dorsal streak, and behind it is a blackish patch covering the base of the dorsal cilia. Apical spot black, and adjoining it

behind is a fan-shaped dark brown patch at the base of the apical cil Ciliæ silvery, *and not containing a black streak from the apical spot to apex.*

The italics above indicate the differences between it and *A. splendo ferella*, and besides, it is much smaller than either that species or *A. el* having an *alar ex.* of less than 1/8 of an inch, and thus smaller th *Nepticula microtheriella*, which, Mr. Stainton says, is the smallest here fore known Lepidopteron. Besides, the antennæ are not so distinc fuscous as in *splendoriferella*, and the golden portions of the wing are n so deep or reddish golden as in that species. It resembles that spec more closely than either *A. ella* or *A. lucifluella.* The pupa case oblong ovate, brownish, not so much pointed at the anterior end as th of *A. juglandiella*, and is a little smaller.

Dr. Clemens found a mine and larva in the leaves of the White Will *(Salix alba)*, which he called *A. saliciella*, but he was not acquaint with the imago. I have not met with that mine, my species having be bred from the Weeping Willow. But as I have no doubt that it is t same species, I have adopted his name.

A. ella. Ante v. 3, p. 224.

In the description of this species I have used the word "before" whe I should have written "behind," as to the location of the costal streak and the whole description is so unsatisfactory that I wish to redescri it. It is, however, difficult to get a good description of a species whi does not present the same appearance in any two views of it.

Head, palpi, thorax and basal half of the primaries pale grayi silvery. Antennæ fuscous above, silvery beneath. Apical half of t primaries black along the *dorsal* margin, the black spreading over t middle of the apical portion of the wing to the golden yellow *costal* pa of the apical half of the wing. This golden yellow costal porti extends along the entire costo-apical margin, and along the middle of t apical portion of the wing it passes gradually into, or blends with, t blackish dorsal portion. (Perhaps a more correct description would b apical half of the wing golden along the costal half, blackish along t dorsal half, the two colors meeting and blending with each other in t middle, and the black passing into the base of the dorsal cilia.) In son lights the golden is strongly tinged with red, and the black becomes deep golden brown. *In the black dorsal portion*, behind the middle of t dorsal margin, is a triangular silvery streak; and opposite to it, *in t*

golden costal portion, is another, the two almost meeting so as to form a fascia, and both dark margined on both sides ; behind the costal streak, at the end of the golden portion and before the apex, is another small costal silvery streak, which is distinctly dark margined before by a straight line, and faintly behind by an oblique one. Apical spot black, and behind and adjoining it is a fan-shaped, dark brown spot, behind which is a straight dark brown streak in the ciliæ, extending to the apex. The apical spot is margined before and on each side with brilliant, metallic, silvery scales, as in *splendoriferella*.

Al. ex. 2 lines or less. Same as in *splendoriferella*, but this species is slenderer than that. The first costal and the dorsal streaks are as in that species, but there is much less golden in the apical half of the wing, and much more blackish or dark brown. The apical spot aud adjoining fan-shaped patch and apical streak are as in *splendoriferella*, but in *splendoriferella* there is but one costal streak. It is, in fact, less like *splendoriferella* than any of the other species. The pupa case is nearly an ellipse, slightly oval, golden yellow, marked with small brown dots.

I was at first in doubt whether this might not be Clemens' *A. lucifluella*, which mines Hickory leaves. But I cannot reconcile it to the requirements of his description, which says that *lucifluella* is larger than *splendoriferella*, and has three costal streaks. I have met with the larva of *lucifluella*, but have not succeeded in raising it. Dr. Clemens met with another mine in the leaves of the Hornbean, which he called *A. astryaefoliella*, but the maker of the mine is still unknown. Possibly it may prove to be this species.

[Since the foregoing remarks were written, I have observed that the microscopic hairs (vegetable) on the surface of the case of *A. ella* are identical with those on the under surface of Hickory leaves, and this tends to the conclusion that this is Clemens' *lucifluella ;* but other leaves may have similar hairs. The fact that I can not recognise it in Dr. Clemens' description is by no means conclusive, for my own first description is certainly defective, and the shades of coloring vary so with the play of the light, that it is a very difficult species to describe satisfactorily.]

ERRATA.—*Ante* p. 128, under *C. gigantella*, in line 5 of the description, for "these" read "three ;" p. 129, for *fagi-costicella* read *fagi-corticella*.

PRELIMINARY CATALOGUE OF THE NOCTUIDÆ OF CALIFORNIA.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

1. *Bombycia improvisa* (Hy. Edw.,) Proc. Ac. N. S., Cal., 5, p. 189.

"Cascades, W. T." Unknown to me and perhaps incorrectly referred to this group.

2. *Pseudothyatira expultrix* Grote.

"Cariboo, B. C.," Hy. Edw., l. c. Unknown to me from the West Coast.

3. *Habrosyne scripta* (Gosse.)

"Alaska" (?) Hy. Edw., l. c. Sitka, No. 137, Hy. Edw.

4. *Acronycta lupini* Behr., Bull. Buff. Soc. N. S., 1, p. 79.

One specimen.

5. *Acronycta lepusculina* Guenee, Bull. Buff. Soc. N. S., 1, p. 130.

A fresh specimen sent by Mr. Behrens gives me some reason to doubt this determination and to suspect a distinct species, allied to *A. leporina* and *A. lepusculina*, in California. The fore wings are narrower, the markings more obliterate above. A different material from that now accessible to me is needed to make any change in this determination or to confirm it with positiveness.

6. *Acronycta perdita* Grote.

♂ Nearest resembling *A. xyliniformis* of any of our Eastern species, but larger, more robust, and with the fore wings even darker. There is an absence of any softer shadings before and behind the transverse posterior line. All the markings are coarser. The terminal series of black interspaceal marks are large and heavy. The transverse posterior line has the outer dentations more uneven; the teeth on veins 4 and 6 are notably longer; the line itself seems hardly so near the terminal margin as in *xyliniformis*. The black shade streak at anal angle is heavier and the dash on the median space is different in position, more incon-

spicuous and near the t. a. line. The median shade is less prominent and the t. a. line more distinct and widely geminate. Hind wings white, like *xyliniformis*, but the fringe is merely black dotted, not cut with black as in the Eastern species. The palpi exceed the front more prominently than in *A. xyliniformis*. *Exp.* 40 m. m. "June 5th," Mr. Behrens.

7. *Feralia februalis* Grote. List of the Noct. of N. Am., p. 60.

"Sanzalito," Mr. Behrens, "February 12th."

8. *Agrotis saucia* (Hubner), Bull. Buff. Soc. N. S., 1, p. 135.

"Oakland," No. 15, Mr. Behrens.

9. *Agrotis fennica* (Tauscher.)

"Kodiak," No. 13, Mr. Behrens. A single ♂, which agrees with Herrich-Schaeffer's figure 146, except that the hind wings are very pale and whitish.

10. *Agrotis lycarum* Herrich-Sch., figs. 122–124.

No. 1392, Mr. Hy. Edwards; No. 31, Mr. Behrens. This species, which seems to be very common in California, I have determined with hesitation. I cannot discover, however, any difference of importance between Herrich-Schaeffer's figures, above cited, and the material before me.

11. *Agrotis Vancouverensis* Grote, Bull. Buff. Soc. N. S., 1, p. 134, plate 4, fig. 4.

"Vancouver's Island," No. 2624, Mr. Hy. Edwards.

12. *Agrotis formalis* Grote, List of the Noctuidæ of N. Am., p. 61.

California, Mr. Behrens.

13. *Agrotis Wilsoni* Grote, List of the Noct. of N. Am., p. 62.

California, Nos. 12 and 24, Mr. Behrens.

14. *Agrotis specialis* Grote, List of the Noct. of N. Am., p. 62.

California, Mr. Behrens.

15. *Agrotis fuscigerus* Grote.

♂ ♀. A species closely resembling *A. Cochrani*, but with notably darker and more fuscous hind wings in either sex. The primaries are

much darker, more evenly colored, without that mottled appearance which has induced Mr. Riley's comparison of *Cochrani* with *chenopodii*. The lines are variably distinct; when present, the inner component line of the t. p. line is usually broad. The four specimens (♂ ♂ ♀ ♀) sent by Mr. Behrens under the No. 25, and as taken Sept. 13th and 14th, expand— ♂ 30, ♀ 35 m. m., and cannot be referred to *Cochrani*.

16. Agrotis Hollemani Grote.

A small species with all the tibiæ spinose; the fore tibiæ have two rows of strong spines. Antennæ pubescent. Fore wings of a dark bluish grey, with hardly a trace of the usual lines. A strong black basal stripe; the cell shaded with black about the discal stigmata, which are singularly shaped, the orbicular elongate and fusing with the moderate, excavate reniform, so that we are reminded of *Oncocnemis Chandleri*. The terminal space is indicated by interspaceal black streaks. Fringes concolorous with internal hair line. Hind wings blackish fuscous, with whitish fringes divided by a hair line. Beneath whitish, powdered with fuscous, without lines; hind wings with a minute discal dot. Head and thorax like primaries; collar with a dark superior line. *Expanse*, 30 m. m. Siskiyou Co., Cal., Capt. Holleman. From Prof. A. S. Packard, jr.

17. Mamestra cuneata Grote, Bul. Buf. Soc. N. S., 1, p. 139, plate 4, fig. 9.

No. 21, Mr. Behrens. "Mendocino, No. 21. The dot near internal angle of fore wings is always yellow; in a few specimens, probably rubbed, it is not noticeable.

18. Mamestra chartaria Grote, Bul. Buf. Soc. N. S., 1, p. 138, plate 4, fig. 12.

California, Mr. Behrens.

19. Mamestra niveiguttata Grote, Bul. Buf. Soc. N. S., 1, p. 140, plate 4, fig. 16.

California, Mr. Hy. Edwards.

20. Mamestra puerilis Grote, List of the Noct. of N. Am., p. 64.

California, Mr. Hy. Edwards and Mr. Behrens.

21. Mamestra cinnabarina Grote, Proc. Bost. Soc. N. H., 16, p. 241.

California, Mr. Hy. Edwards and Mr. Behrens. Several specimens show a range of variation in the extent of the brown and palest tint on the primaries above.

22. *Mamestra laudabilis* (Guen.)
California, Mr. Hy. Edwards.

23. *Mamestra 4-lineata* Grote, Bul. Buf. Soc. N. S., 1, p. 140, plate 4. fig. 15 and List, p. 13.
California, Mr. Hy. Edwards and Mr. Behrens.

24. *Dianthœcia leucogramma* Grote, List. p. 64.
California, Mr. Hy. Edwards and Mr. Behrens.

25. *Dianthœcia rufula* Grote, List of the Noct. of N. Am., p. 64.
California, Mr. Behrens. "Oakland, No. 22."

26. *Dianthœcia insolens* Grote, List of the Noct. of N. Am., p. 65.
California, Mr. Behrens.

27. *Oncocnemis Behrensi* Grote, List of the Noct. of N. Am., p. 65.
California, Mr. Behrens. "Sanzalito, Feb. 10th to 24th."

(To be Continued.)

CORRESPONDENCE.

GRAPTA COMMA AND DRYAS.

DEAR SIR,—

I am able to give you the results of an experiment made with *Grapta comma*, the converse of that made in 1873 with *dryas*. On the 10th of May last I took a female, true *comma*—red hind wings and plain brown underside—and tied it up to a branch of Hop-vine, which branch was free from eggs of any sort. She laid in the bag some forty eggs, and I had from them thirty-nine caterpillars. Most of them in due time reached the chrysalis state, and between the 10th and 15th of June there emerged thirty-four butterflies—every one a *dryas*. In the fall of 1873, from eggs of *dryas*, there resulted a large number of *comma* and six *dryas*, as stated in the ENTOMOLOGIST for October. I think this fully settles the question of the dimorphism of the species.

Yours truly,

W. H. EDWARDS, Coalburgh, W. Va.

MISCELLANEOUS NOTES.

DEAR SIR,—

I send you the following items, hoping they may prove of interest:

CLISIOCAMPA SYLVATICA.—The caterpillars of this pest are swarming on almost every description of tree or shrub in the vicinity of this city, many trees being completely denuded of foliage. *C. Americana* is also common on apple trees.

LACHNOSTERNA QUERCINA. — This insect, though usually very abundant, has been quite scarce this season; I have not seen more than a dozen specimens.

DEPRAVED TASTE OF P. TURNUS.—One day early in June a *P. turnus* which I was pursuing hovered over and alighted upon some cow droppings, thrust out its tongue, and settled itself quietly to its disgusting repast. While in this position it was easily captured.

On the 27th of July, last year, it rained very heavily during the evening in the vicinity of Portland, where I was spending the summer; but the night seemed very favorable for moths, a large number entering the house, among them a fine specimen of *Philampelus satellitia*, two of *Arctia virgo*, and one of *Arctia rubricosa*, besides a number of others with the names of which I am not acquainted.

DESCRIPTION OF THE EGG OF GASTROPACHA AMERICANA.—The eggs of this moth are very pretty, being white with peculiar black markings. They were laid June 27th, by a female reared in confinement. Length .06 of an inch; width, .045. Form oval, flattened at the base and also above, but a little thicker at one end than at the other. At each end there is a semi-circular stripe and dot, closely resembling the crescent and star of the Turkish arms, and these markings are larger and more distinct on the larger end. On both the flattened surfaces there are markings like eyes, each formed by an oval spot in the centre, with a curved stripe above and a shorter straight one below, of which the latter is widened towards the extremities. Between and parallel to the two eye-brow-like marks there is another black stripe which is widest at the larger end of the egg, and tapers towards the other. Over the whole surface there is a minute indented reticulation, the meshes of which are irregular in form, with a depressed dot in the centre of each.

H. H. LYMAN, Montreal, P. Q.

DEAR SIR,—

A few days ago I went to a swamp where *Phæton* feeds in early spring, and discovered several of the webs of that species spun over the stems of *Chelone glabra* and whatever other plants were contiguous. Within the webs were larvae about ¼ inch long, and as during the last few days, since I have had a number of them in the house, there is no appearance of feeding by the larvae, I presume they are quiet for the season and till next March. Seeing a good many *Phyciodes marcia* flying in the swamp, it occurred to me to try a female with a stem of *Chelone glabra*, and I did so with satisfactory results, as three days after I enclosed her in a bag, she laid about 75 eggs on the under side of one of the leaves. I hope I have at last found the food plant of this species, after having tried a score of plants to no purpose.

W. H. EDWARDS.

EDITORIAL SUMMARY.

PALÆONTOLOGY OF ONTARIO.—We are much pleased to observe that the Legislature of this Province is extending its liberality in the cause of Science to other departments, besides those somewhat utilitarian branches of Entomology and Horticulture, as is eminently manifest from the excellent Report before us on the Palæontology of Ontario. It has been prepared by Prof. H. Alleyne Nicholson, of the University of Toronto, and contains descriptions and figures of the organic remains of the Devonian Formation of Western Canada. No less than one hundred and sixty species of fossils are described, and illustrated by means of nearly sixty wood-cuts in the text, and eight splendid lithographic plates. It is noteworthy, also, that all the figures are original, except two of the wood cuts. We trust that the Legislature will long continue its assistance to this excellent work, and that Prof. Nicholson may be enabled to carry out a complete investigation of the Palæontology of all the fossiliferous geological formations in this country.

AMONG the "old country" publications that we have lately received, we may mention the 15th number of the *Scottish Naturalist* (Dr. F. B. White, Perth.) We gather from its pages that a goodly number of Field Clubs are being organized in Scotland, and that much satisfactory work

is anticipated from them. Cannot something of the kind be re-inaugurated here with a fair promise of success?————*Nature* continues to be as well filled as ever with most interesting and instructive matter; recent numbers have contained seasonable articles upon the Comet and the Transit of Venus, and a series of illustrated papers upon the observatories of the United States.————European potato growers are beginning to become alarmed at the prospect of a speedy invasion of their fields by the devastating Colorado Beetle. As it has now very nearly reached the Atlantic seaboard, we have little doubt that in another year or two it will succeed in crossing the ocean and striking terror into the hearts of all patriotic Irishmen. Mr. Newman, in a recent number of his "Entomologist," while he confuses the sweet potato with the ordinary potato, and the insects that prey upon these very different plants, expresses his disbelief in the prospect of trouble from any of our American pests. He goes on, however, to quote all the remedies against the Colorado beetle contained in the Report of our Society—without acknowledgement!

WE REGRET to announce the death of Mr. Geo. R. Crotch, M. A.. of St. John's College, Cambridge, who sailed from England to America in 1872 for the purpose of studying the Entomology of parts which he considered incompletely known. He made collections, especially of Coleoptera, in California, Vancouver's Island, Oregon and other Districts. So much were his labors valued in England that his University on two occasions voted him a sum of money to aid him in the formation of collections for the Museum at Cambridge.

THE 23RD Meeting of the American Association is to take place this month at Hartford, Conn., beginning on August 12th. Dr. LeConte is the President elect. As an invitation was extended at the Portland meeting to the members of the Entomological Society of Canada to be present on this occasion, we trust that many of our friends will make a point of attending; there will no doubt be a large attendance of insect hunters from all parts of the continent.

THE 44TH Meeting of the British Association is to be held at Belfast, under the Presidency of Prof. Tyndall. It is to commence a week later than that at Hartford.

C. J. S. B.

The Canadian Entomologist.

VOL. VI. LONDON, ONT., SEPTEMBER, 1874. No. 9

THE AMERICAN ASSOCIATION.

At the recent gathering of this scientific body, in Hartford, Conn., there were brought together an unusual number of Entomologists. This was owing partly, no doubt, to the kind invitation extended by the Association to the American and Canadian Entomological Societies, to appoint special meetings of their members to be held at that time and place, with the view of having these important Societies fully represented. In response to this invitation, a number of members of the American Entomological Society were present, while our Canadian Entomologists were represented by the worthy President of our Society, Rev. C. J. S. Bethune, M. A., and the Editor of the ENTOMOLOGIST. Several evenings were occupied by these "brethren of the net" in interesting and profitable discussions on the habits and peculiarities of various insects, the time passing so pleasantly that the midnight hours were reached ere a separation could be effected. After mature deliberation it was resolved to organize under the name of "The Entomological Club of the A. A. A. S," and the following constitution was adopted :

TITLE.

I. The name of the association shall be "The Entomological Club of the American Association for the Advancement of Science."

OBJECTS.

II. The annual reunion of the Entomologists of America, the advancement of entomology, and the consideration of all general questions relating to the science that may from time to time arise.

MEMBERSHIP.

III. All members of the American Association for the Advancement of Science who are interested in Entomology, shall *ipse facto* be members of the club.

OFFICERS.

IV. The officers of the club shall be a President, a Vice-President, and a Secretary, to be elected annually by vote of the members.

DUTIES OF THE OFFICERS.

V. The President, or in his absence, the Vice-President, shall preside at all meetings; the Secretary shall perform all the usual duties of a recording and corresponding secretary.

MEETINGS.

VI. A meeting shall be held in each year at the place of meeting appointed by the American Association for the Advancement of Science; it shall commence at 2 : 30 p. m. on the day before the meeting of the American Association for the Advancement of Science, and be continued throughout that evening; further meetings may be held as time will permit during the week following.

The following resolutions were also unanimously passed:

Resolved, That the members of the American Entomological Society and the Entomological Society of Ontario, together with all other persons interested in entomological science, be cordially invited to attend and take part in the proceedings.

Resolved, That the secretary be requested to publish notices of the meeting in such periodicals devoted to natural history, and especially in those devoted to entomology as are published on the continent; and further, that the members be requested to bring with them at the annual reunions specimens for exchange and exhibition, and especially types of species that they may have described during the year.

At a subsequent meeting of the Club, the following officers were elected: President, Dr. John L. LeConte, Philadelphia, Pa.; Vice President, Samuel H. Scudder, Cambridge, Mass.; Secretary, Chas. V. Riley, St. Louis, Mo. We feel sure that under such able direction, the Entomological Club of the A. A. A. S. will prosper, and be the means of stimulating many to increased effort, and thus greatly advance the interests of our favorite study.

As it may interest many to know who were present at these meetings, we furnish the following list: Dr. John L. LeConte, Philadelphia, Pa.; Dr. J. G. Morris, Baltimore, Md.; Prof. S. S. Haldeman, Chickis, Pa.; Dr. H. A. Hagen, Cambridge, Mass.; S. H. Scudder, Cambridge, Mass.;

A. R. Grote, Buffalo, N. Y.; Dr. G. M. Levette, Indianapolis, Ind.; C. V. Riley, St. Louis, Mo.; O. S. Westcott, Chicago, Ill.; J. A. Lintner, Albany, N. Y.; H. F. Bassett, Waterbury, Conn.; George Dimmock, Springfield, Mass.; B. Pickman Mann, Cambridge, Mass.; E. P. Austin, Cambridge, Mass.; Dr. R. King, Kalamazoo, Mich.; Chas. P. Dodge, Washington, D. C.; Mr. Patton, Waterbury, Conn.; Rev. C. J. S. Bethune, M. A., Port Hope, Ont.; W. Saunders, London, Ont. During the meetings of the Association several interesting and valuable papers on Entomological subjects were read by Dr. LeConte and Messrs. Scudder, Riley and Grote.

THE LINNEAN SIGNIFICATION OF THE GENERIC TERM PAPILIO.

BY H. HAGEN, CAMBRIDGE, MASS.

In a recent issue of the CANADIAN ENTOMOLOGIST, No. viii, Vol. vi, there appears from the pen of Mr. Scudder a paper on "The Linnean Signification of the Generic Term Papilio," containing some statements on which I propose to offer a few remarks.

The data given by Scudder from Linné's works are—save some minor typographical errors—correct, excepting in two important points. On p. 144 he says "in the year 1846 the first edition of the Fauna Suecica was published, *in which Linne for the first time treats of species, giving to them names in the language of the country.*" (The italics are mine.)

In the first place, Linné did never give either to animals or insects names in the language of his country. This is important in view of Mr. Scudder's proposition in "Psyche" to give such names for the convenience of non-entomologists. The names quoted by Scudder, viz., morio, polychloros, &c., are never given by Linné as *names of the species*, but just *at the end of the synonyms, quoted as synonyms*, always in this form, *vulgo* morio. These names were *never invented* by Linné, but were used by former naturalists; some are to be found in Petiver's Museum, viz., Oculus pavonis (not Oculis), Bella Donna, Ammiralis (the Admiral) Argus, in Rajus Hist. Ins. and in Albin. Engl. Insects, Brassicaria, Urticaria, etc.—the others in different other authors. Even Linné used some of them before, in his Elenchus, viz., Bella Donna, Oculus pavonis, and always in this manner:

Bella Donna *dictus*, Oculus pavonis *dictus*, showing clearly that the names were not given by himself. Such names as are quoted with *vulgo* are not numerous, although in much larger proportion in Lepidoptera than in any other order. I find 25 such among 37 Papilio, and 14 Phalenæ only among the 114! described; in other orders the proportion is much less. There is not in the whole Fauna Suecica one name given by Linne. In the rare cases where Linne quotes Swedish names he has never given these himself, but quoted them as synonyms, as in Phal. mori.

Vulgo Bombyx.

Suecis Silkesmask.

In the end of the last and in the beginning of the present century there was a general tendency to give to every insect a name in the language of the country in which it was found. In this work labored Donovan for England, Fourcroy and Geoffroy for France, Sepp for Holland, Isert for Sweden, Bruennich for Denmark, Panzer and Sturm for Germany; but very soon it was seen that this business was a difficult one, often the names were not appropriate, some were foolish, and others even ridiculous, while it was apparent to all that such names, instead of being a benefit to science, were only a burden, and soon the matter was dropped entirely.

Even in the case of injurious insects it is seldom necessary to invent common names, for where species are really destructive the people almost always have a name for such just at hand.

With regard to the *second* point in the paragraph quoted, Linne treats of species first in a paper published in 1736, in Acta literaria et Scientiarum Sueciæ Upsala, T. iv, p. 97–138, *Animalia per Sueciam observata*. This paper is reprinted Lugduni Batav. 1743 in 8vo., *Elenchus animalium per Sueciam observatorum, p. 37–94*. Linne himself quotes this paper later always "Acta Upsal, 1736," and states in the preface of Fauna Suecica, 1st edition, "quum ad patriam Academiam Upsaliensem 1729 degerem, conquirendis insectis primam dedi operam, nec prius destiti, quam visendæ mihi essent 1735 aestivæ regiones. Eorum quæ reperi, catalogum a me exhibitum. Regia Scient. Soc. Upsal. actis suis pro anno 1736 inseruit."*

* When I studied in 1729 at my native Academy of Upsala, I collected chiefly insects, nor did I desist until I started to visit other countries in 1735. Of those which I found, the Royal Scientific Society of Upsala published in their proceedings for the year 1736 a catalogue prepared by me.

The Elenchus (just as the first edition of the Fauna Suecica) has *no names of the species* (I say purposely so, as Linne called NOMINA TRIVIALIA what to-day is called SPECIES NAME, and Linne called NOMEN SPECIFICUM what to-day is called DIAGNOSIS) but always a diagnosis, and where it was possible, quotations of former authors, viz., Petiver Museum and Gazophylacium, Rajus, Albin, &c. The species given in the Elenchus are just as easily recognized as those in the Fauna Suecica, Ed. 1, by comparing the quoted authors and the diagnosis. It follows, therefore, that if the first edition of the Fauna be recognized to have right of priority, the Elenchus must be recognized to have the same right.

Now, the genus Papilio is established in Syst. Nat. Ed. 1, 1735. The Elenchus *is the first publication with species* (1736) after it, and the first Papilio is *P. Rhamni*, quoted as Papilio sulphureus Petiv. Mus. 1. Comparing Petiver's words and Linne's Fauna Suec., Ed. 1, No. 795, the identity of this Papilio sulphureus with P. Rhamni is sure.

I give here the list of the species of the Elenchus and of the first edition of the Fauna Suec., i and ii :

Elenchus.	*Faun. Suec., Ed. i.*	*Ed. ii.*
1. Rhamni mas.	1. Antiopa.	1. Machaon.
2. Rhamni fem.	2. Polychloros.	2. Apollo.
3. Brassicæ.	3. Urticæ.	3. Mnemosyne.
4. Rapæ.	4. C. album.	4. Cratægi.
5. Napi.	5. Io.	5. Brassicæ.
6. Cratægi.	6. Atalanta.	6. Rapæ.
7. Apollo.	7. Cardui & follow	7. Napi & follow
	24. Rhamni.	12. Rhamni.
10. Antiopa.	25. Cratægi.	21. Antiopa.
11. Polychloros.	26. Napi.	22. Polychloros.
12. Urticæ.	27. Rapæ.	23. Urticæ.
13. C. album.	28. Brassicæ.	24. C. album.
14. Io.	31. Apollo.	25. Atalanta.

Follow ; Linne first (1736) places P. Rhamni at the head of the genus Papilio ; second, 1746–48 (the later editions until 1756 are only reprints) P. antiopa at the head, and third, 1758, and following, the swallow-tails at the head, beginning with P. priamus in Ed. x, Syst. Nat., and with P. machaon in Ed. 4, Fauna Suecica.

In the Fundamenta Entomologiæ, 1767, 4to p. 32, Linne speaks about the division of Papilio into five classes, devoting more than a page

to this subject, and says strictly that his *Equites* form the first class, *Heliconii* the second, *Danaii* the third, *Nymphales* the fourth, *Plebeii* the fifth.

The closing lines in Mr. Scudder's paper should therefore be amended so as to read thus: "In Linne's mind which was a typical Papilio—Rhamni, or Antiopa, or Machaon? The answer is simply that Linne in his study arrived at the conclusion that the first class of his Papilio should be formed by the Equites. I would remark, however, that Linne *never speaks*, as far as I know, *of any particular species being the type of its class*, and *this idea that his first species is the type* is of very recent date.

The fact that so few Entomologists have the opportunity of consulting Linne's older works, induced me to publish these statements.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 153.)

ANTISPILA.

A. cornifoliella ? Clem.

Can there be two Antispila miners of the Dog-wood? Either there must be, and my specimens are specifically distinct from this species, or Dr. Clemens' description is strangely erroneous in at least one particular, viz., the color of the fascia and streaks, which he says are golden in *cornifoliella*, but which are silvery white in my specimens, all of which—six in uumber—agree exactly in ornamentation, and all but one of which are bred specimens. The species of the genus generally resemble each other very closely, and some recognized species do not differ from each other more than my specimens do from Dr. Clemens' description. Neither is it improbable that two species mine the leaves of the Dogwood, for the same thing occurs in Europe, where *A. Pfeifferella* and *A. Treitschkiella* both mine the leaves of *Cornus sanguinea*. *A. cornifoliella* and my specimens both mine the leaves of *Cornus florida*. I subjoin Dr.

Clemens' description for the purpose of comparison with my own specimens :

" *Head, face, labial palpi and fore feet dark brown.* Antennae dark brown ; basal joint somewhat ochreous. Forewings rather dull dark brown, with a coppery hue. Near the base is a rather narrow, golden band, *not constricted on the fold, and rather indistinct toward the costa.* where it is somewhat suffused with a coppery hue, and nearest the base on the inner margin. At the apical third of the wing is a small golden spot, and nearly opposite, on the inner margin, another of the same hue, with the hinder portion of the wing tinged with a bright reddish coppery hue ; ciliae dark grayish. Hind wings purplish brown ; ciliae somewhat paler, with a coppery hue."

The italics are Dr. Clemens'. The following description is drawn from the six bred specimens above mentioned :

Head and face dark brown or brilliant metallic, according to the light ; labial palpi yellowish white ; tarsi all yellowish white, with each joint tipped with dark brown on its anterior margin. Antennae dark brown, with the two or three joints nearest the base ochreous, and *the extreme tip white.* Fore wings and thorax dark brown, blackish, bronzed or tinged with purple, according to the light ; before the middle of the wing is a slightly curved fascia, which is widest and nearest to the base on the dorsal margin, *not constricted on the fold, but quite distinct throughout.* A costal and dorsal streak just before the ciliae, the costal streak a little behind the dorsal one. In fresh specimens this fascia and these streaks are silvery white ; in old specimens they have a faint golden hue in some lights. (Clemens describes them as golden.) *Basal half of the ciliæ purplish ; apical half grayish silvery. Al. ex.* scarcely ¼ inch.

Dr. Clemens suggests that *cornifoliella* may be a variety of his *Nysæ foliella.* I have never succeeded in breeding the latter species.

A. isabella, Clem.

I find nearly the same differences between my specimens (bred) of this and Dr. Clemens' description, that I have noted above as to *cornifoliella.* Dr. Clemens says that the fore wings have no greenish or violet reflections, which is certainly incorrect. The fascia is wider than in *cornifoliella*, the thorax more shining metallic, the purple hinder marginal line is less distinct, and the entire wing is less purplish, and the species is a little larger. Nevertheless, they resemble each other very closely. The

costal and dorsal spots in both are of nearly equal size, or the costal one is a little the largest.

A. viticordifoliella. N. sp?

Dr. Clemens mentions a mine and larvæ in grape leaves to which he gives this name, but he was not acquainted with the imago. Though it sometimes happens that more than one species of a genus mines leaves of the same plant, and it is therefore possible that the species described below may not be the same referred to by Clemens, yet from his description of the mine and larva, I feel confident that it is, and have therefore given it the name suggested by him.

Dark brown, inclining to blue black, with a purplish tinge in some lights, and in some lights bronzy brown or greenish; thorax and base of the wings with pink, purple or topaz red reflections, according to the light. A nearly straight silvery white fascia before the middle of the wings, not constricted on the fold, widest on the dorsal margin, where it is also a little nearer to the base; a large triangular silvery white dorsal streak just before the beginning of the ciliae, and a smaller one at the beginning of the costal ciliae. Ciliae white. Tarsi yellowish white, each joint tipped in front with dark brown. Face yellowish white; antennae dark brown, with about six terminal joints silvery white, and the six preceding ones alternately white and dark brown. It is a little smaller than *A. cornifoliella*. The mine, larva and case are smaller than those of *A. isabella*, and the case is elliptical in shape, whilst in *cornifoliella* and *isabella* it is nearly circular.

A. ampelopsifoliella. N. sp.

This species is known only in the larval state, unless the species described, but not named below, may be the same. The mine, larva and case are very small, smaller than any other known species. It mines the leaves of *Ampelopsis quinquefolia*, and the mine is elliptical in outline. I find that I have mislaid my notes upon the larva. I have never succeeded in breeding it.

Can not something be done towards determining the original of some cultivated plants by a knowledge of the habits of insects which feed upon them? A great majority of herbivorous insects are doubtless polyphagous, but many are confined to a single group of plants, and some to a single species. When an insect known to feed only on a single wild species, if found feeding on an allied cultivated plant, is it not a fair

deduction that the cultivated one is derived from the wild stock? Dr. Clemens states that he bred his species *A. isabella* from the cultivated grape Isabella, which, if I am rightly informed, is supposed to be derived from *Vitis labrusca.* I have bred it from at least a dozen cultivated varieties, including Catawba, Hartford Prolific and Concord, but I have also bred it from the wild *Vitis cordifolia*, so that this instance proves nothing. But Dr. C. records the larva of *A. viticordifoliella* from the leaves of *V. cordifolia* only, and I have never found its mine in any other species or variety. Would there not be a presumption—if it should now be found mining any cultivated variety—that that variety sprang from the *cordifolia* stock? So Dr. C. records *Phyllocnistis vitigenella* from the leaves of *V. cordifolia* only, whilst I have found it in the leaves of a great many cultivated varieties, including those above named, so that it proves no more than *A. isabella;* but *P. vitifoliella* I have never found elsewhere than in the leaves of *V. cordifoliella*, and one or two cultivated vines of which I find I have kept no memorandum.

Some years ago I bought from the gardener of the late N. Longworth, of Cincinnatti, a grape vine of a variety but little cultivated, called "Longworth's Seedling, No. 20," the origin of which the gardener refused to tell me. The foliage is unlike that of any other grape known to me, and is still less like that of *Ampelopsis quinquefolia*, and approaches *V. cordifolia.* Last summer I found its leaves mined by a larva closely resembling that of *A. ampelopsifoliella*, *supra*, and which I suspect to be the same. I have never found it in the leaves of any other plant, though over a dozen other varieties of grapes grow within a few feet of the Longworth vine. From it I bred the species described below, which I do not now name, as it may prove to be identical with *A. ampelopsifoliella.* The single specimen was a little injured, and the description is therefore in one or two respects imperfect.

Palpi pale yellowish? Head and face bright but pale golden, in some lights silvery, tinged with golden. Antennae brown, *faintly* annulate with whitish. Thorax and primaries rich purplish brown, in some lights strongly purple or bronzed; before the middle of the primaries is a somewhat oblique fascia, which is silvery, or bright but pale golden according to the light, widest and nearer to the base of the wing on the dorsal margin, and not constricted on the fold; a silvery or pale bright golden spot on the dorsal margin, just before the ciliae, and a smaller costal one nearly opposite, *and a spot of the same hue at the apex.* Ciliae a little

paler than the wings, but I can not discover any hinder marginal line. *Al. ex.* ⅓ inch.

The larva is white, without maculae, but with the anterior margin of the first segment brown.

A. hydrangœella. N. sp.

The mine and larva only of this species is known, and I have never succeeded in rearing the imago. The mine, larva and case resemble those of *A. viticordifoliella*, but are perhaps a little smaller. It mines the leaves of the wild *Hydrangea (H. nivea.)*

Dr. Clemens states that the species described by him mine the leaves of the various plants in the latter part of August and in September, from which I infer that he found them only at that time. But the mines of all the species may be found as early as the first of July, and in increasing numbers from that time until the fall of the leaves. I have reared *A. cornifoliella* in the latter part of July, from leaves gathered in that month, and have found the mines and larvae of all the other species, though I have only succeeded in rearing the other species in the spring from mines gathered in the fall.

NOTES ON THE "LIST" OF 1868.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

Preparatory to a fresh edition of the "List of Lep.," of 1868, a few memoranda of the necessary changes will be published.

Sesia uniformis, p iii. This species is distinct from *thysbe*, and has been noticed by Mr. Lintner in his valuable "Entomological Contributions." Mr. Couper found it on Anticosti. This can not be *Sesia ruficaudis* Kirby, the description of which is given on p. 27 of the "Synonymical Catalogue" of 1865. Kirby says: two first segments of the body yellow olive, two next black, the rest ferruginous with yellow olive spots. *Uniformis* has the first segments yellow olive, the next deep ferruginous, the next again olive, and the anal hairs black, with ferruginous central tuft. In fact, Kirby's description rather resembles *diffinis* in the body parts. And from his comparison with *fuciformis*, we should think

at once of *diffinis*. But the terminal segments in *diffinis* are not "ferruginous" any more than in *uniformis*, and so Kirby may have had a boreal species we do not yet know before him. From his description there is no more correspondence with *uniformis* than with *thysbe;* rather does his description agree with *fuscicaudis* as to the abdomen terminally.

Cressonia juglandis, p. iv. To this species must be cited *Sm. pallens* of Mr. Strecker, whose figure represents a pale ♀ specimen of *C. juglandis*, without the median shade on the forewings. Belfrage has sent *C. juglandis* from Texas.

Dysodea || p. vi. This generic name is preoccupied and must give way to that of *Platythyris*. Mr. Walker's type of *Varnia* appears distinct. We have probably but one species which should be known as *Platythyris oculatana*. Boisduval's figure and description of *Vitrina* do not agree with our species, and probably *vitrina* represents *oculatana* in Europe. Much confusion has occurred through Dr. Clemens having described the species figured by us, Am. Lyc. Nat. Hist., N. Y., vol. viii, pl. 13, figs. 4–5, as one of the Tortricidæ, and without referring to Boisduval's original illustration of the genus. A second species is afterwards described by Dr. Clemens under the name of *Dysodia margaritana*, which I have never seen. Consult Am. Soc. Belge, T. 7, Pl. 1, for an illustration ot the embryonic stages of *Thyris*. They seem to correspond generally very well with Dr. Clemens' characters of the larva of *Dysodea*.

NOTES ON MEGACHILE CENTUNCULARIS.

BY THOS. G. GENTRY. GERMANTOWN, PA.

Since so much has been written upon the habits of our ordinary Leaf-cutting Bee, it would seem presumptuous for me to offer anything further in connection therewith. But a few facts which came to my notice recently are sufficiently interesting and important to merit publication.

During the latter part of June, 1873, several cells, a half a dozen in number, were sent to me by a friend, who had accidentally brought them to light while digging underneath the shade of a *Spiræa corymbosa*. They were found in close proximity to each other, arranged in a nearly horizontal position, at a depth of three inches below the surface of the

ground. The soil was comparatively solid. From the freshness of the leaves which composed the cells it would seem that the work had but lately been accomplished, but after the examination of a few, it was evident that some time had elapsed, since the larvae had attained to considerable dimensions.

The cells were nearly three-quarters of an inch in length, with a diameter of one-fourth of an inch. They were constructed of nearly perfect leaves of *Spiraea corymbosa*, instead of those of the various species of Rose. The outermost circle of leaves, three in number, had their margins slightly overlapping on the exterior, each piece forming an arc of a circle of 120 degrees. Within these were other three, arranged alternately with them; others, again, alternating with the latter, and so on until there were no less than six circles, having eighteen pieces in all. Each succeeding individual layer from without inwardly projected but slightly beyond its predecessor, having but a slight resemblance "to a long sleeve with folds upon it," as has been affirmed by writers. The mouth of each cell was closed by six circular pieces of leaves, nipped from the same plants. These were a trifle larger than the mouth of the cell, and when in position presented a concave surface facing outwardly. It is obvious that the whole structure is a striking proof of adaptation to an end. If the cell had been arranged vertically, its structure would doubtless have afforded water a ready access to the larva and its food, and thus have defeated the object which nature had in view. In the horizontal position the tile-like arrangement in the exterior, acts as a sort of roof by which the water is turned off. The concave arrangement of the circular pieces subserves a similar purpose. The freshness of the leaves was due, no doubt, to the protection which the enveloping earth afforded. The chemical rays of sunlight, which act upon the parenchymatous material of the leaf, when deprived of its vitality, converting the green and granular chlorophyl into others of a brownish hue, operate with less intensity at the depth of three inches. The comparative absence of moisture in the ground, no doubt, prevents oxidation; there being ample moisture at the same time to insure softness and prevent rigidity.

During the early part of last April (1874), several cells were brought to me by one of my pupils, which, on a superficial examination, appeared to be the mud cells of our ordinary *Pelopœus*, the mud-dauber. They were found adherent to the rafters of an unplastered attic. The cells were arranged side by side in numbers of three. On the exterior there

were no shallow grooves, denoting lines of demarcation. With this unimportant difference, the general outline of the mud mass, with its combination of pellets, was exactly similar to that constructed by the mud-dauber. Had the lines of separation existed, I should have had no hesitancy in characterizing it as a case either of usurpation of instinct upon the part of the *Megachile*, or one of confiscation of property.

Within, exposed to view by detachment from the aforesaid rafters, were what I supposed to be the leafy cells of *Megachile*. The length of these and the peculiar disposition of their parts, materially different from what I had always observed, operated upon my mind to such an extent that I was almost constrained to believe that I had met with something altogether new to science, or else that I had been fortunate enough to discover a species of *Pelopæus* with *Megachile*-like habits.

Each cell was one and one-eighth inches in length, with a diameter slightly exceeding one-fourth of an inch. It was built of elliptical pieces snipped from the leaves of a species of *Spiræa* (*S. corymbosa*, it seemed to me.) The pieces were of less dimensions than those before alluded to, and arranged somewhat on a similar plan, except that there was a strong appearance of a double cell, as if the inferior concavity of one cell had been deposited in the superior concavity or mouth of the other. This resemblance held true to a certain extent, but the absence of a clear line of division between the two seemed to militate against the idea of a double arrangement.

Having kept a few of the cells a reasonable length of time, until all hope of seeing insects emerge therefrom had vanished, I began the work of destruction by carefully pulling some of them to pieces. While engaged in my labor I was led to notice the comparative ease with which each relative structure separated in the middle. Within the aperture of one cell was a cylindrical pouch, composed of pure silk, glazed within by an oily secretion from the larva. This containsd a perfect, but dead bee, which was readily identified as *Megachile centuncularis*. The lower half of the same enclosed a similar silken sack, with fragments of legs, wings, antennæ and complete body segments, with a mass of debris which showed the clearest evidence of the ravages of some ruthless destroyer. Under a glass of moderate power, I had little difficulty in recognizing the fragments as parts of a *Megachile* similar to the above.

This last fact impressed me as peculiarly interesting and novel, as showing the economy which exists and is practiced among certain

individuals of this species. To construct the inner leafy cells, with their numerous parts, is a labor of little moment when contrasted with the hours that must be spent in moulding the clay for the outer side into small pellets, and then adjusting them to their proper positions. The existence of two bees in separate cases of silk, one above the other, in the same earthy apartment, seems to imply the existence of a double leafy cell, even though a partition between the two should be wanting.

It would appear that the deposition of one cell upon another would defeat the object which the mother *Megachile* had in view. On the supposition that oviposition in the upper cell took place subsequently to that in the lower, the time of leaving the egg would be earlier in the latter, the larva would sooner mature, and the perfect insect would be prepared to leave its prison-house anterior to its associate, and, being unable to effect its exit by reason of the narrowness of its domicile, would perish. This, doubtless, would be the upshot of the affair if similar cells in like situations should be built in the summer season. But as far as I have had any experience in the matter, the summer abodes of *Megachile* are single, a few inches below the surface of the ground, and generally under the shelter of some protecting shrub, where the warm rays of the sun can not effect any mischief. This site is doubtless well selected for the reasons above adduced.

There are usually two broods of this species in a season ; a summer brood, which makes its appearance early in July, and a spring brood which has survived the winter in its double cell of earth and leaves. It is possible that the larva, after having exhausted its stock of honey and pollen, its natural food early in the fall, passes into the condition of a pupa, and thus remains until awakened from its sleep by the genial warmth of spring.

In the cells designed for the winter accommodation of the species, the double arrangement of the inner cells will not materially affect the original purpose, since both insects will have passed through the cycle of transformations, and when the suitable time shall have arrived for their departure, the one occupying the upper cell will have made its way out and thus left a clear passage for the one below.

The absence of a line of separation between the two cells appears to indicate that the food had been deposited in the lower cell, and two eggs instead of one had been left in mistake. Where it is the custom of the insect to deposit but one egg, instinct teaches it to collect just enough

food to provide for the sustenance of the larva to which it gives birth; the two eggs in the present cases were deposited through some inadvertence upon the part of the insect, and it does not seem wise to conclude that a similar inadvertency had led to an accumulation of a double portion of food. If this double brood had been the result of mistake, it is not possible that several mistakes of a similar kind would have occurred, since it was my good fortune to meet with unoccupied cells that showed evidence of being once occupied.

If two eggs are deposited within the same cell, there must be collected a double quantity of pollen and honey for the nourishment of the larvæ. The one which attained to full growth first would, no doubt, seek a clear space in which to spin its covering, and this would be afforded by the upper part of the tube or upper cell. The other, after having made a sufficient space for this essential operation by the consumption of the remaining food, would accomplish the task therein.

Some cells, which it was my privilege to examine, exhibited faint tracings of a partition-like arrangement between them. A portion of the debris in the lower cell, to which reference has been previously made, may have been due to the comminution of the leaves forming the separating layers, through some cause or other. But this I am unable to substantiate. If such should prove to be the case by future observations, there is no doubt that there will be found to exist a separate accumulation of pollen and honey in each cell.

After a little reflection, there seems to be an offset to a portion of this argument. May it not be possible that after the two larvæ had matured into perfect insects, the more powerful one overcame the weaker, and that the fragments of wings, legs, body segments, &c., are the sad trophies of such a conflict? This point would be worthy of acceptance if every cell which was examined had betrayed similar evidences. But it was not the case. It only remains, then, to assume one of two opinions—either that the two ova were deposited upon a double allowance of food, so that the larvæ, when hatched, should find ample sustenance to reach maturity, and subsequently had constructed their silken cocoons in their respective positions, said positions being determined upon by priority of growth; or, that a double cell was built, one on the top of the other, each properly victualled and provided with an ovum.

STRAY NOTES ON CANADIAN DIPTERA.

BY BEVERLEY R. MORRIS, M. D., NOTTINGHAM, ENGLAND.

The following fragmentary notes are submitted to the readers of the CANADIAN ENTOMOLOGIST in the hope that they may assist in even a small measure in determining the numbers of this order occurring in the Dominion.

When in Canada I only incidentally captured Diptera, and the number I possess is very limited. I am indebted to F. Smith, Esq., of the British Museum, for the names of those given below. There are some other species as yet undetermined, and which on some future occasion I may succeed in getting named. The localities and dates given may be relied upon, as I numbered every insect taken, and recorded the date and locality at the time. I have included a few taken in New Hampshire and Maine, as it is probable they may also be found in Canada. Apologizing for the imperfection of the list, I send it in hope of assisting any one who may take up the Diptera of Canada. For the labels being lost off some I am indebted to the gross carelessness of one of our railways, over which the cabinet containing my insects was sent. I found great numbers loose, some ground to powder, others more or less injured, and many with the tickets shaken off. This prevents my being certatn of the localities, &c., in some cases, but I *believe* all were taken in or near Toronto.

Anthrax fuscipennis, Say.

I took this fly in considerable numbers on the carriage drive in front of the Rev. W. Ritchie's, at Georgina, on the 8th of August, 1863. They were hovering over holes in the gravel.

Anthrax analis, Say.

Taken at the same time and place, and along with the last. Habits the same.

Anthrax bastardi, Macq.

One was taken at Orillia in August, 1863. I also took one at Gorham, in New Hampshire, on August 19th, 1861.

Anthrax terminipennis, Say.

Labels lost, but taken, I believe, at Toronto.

Anthrax fulvina, Say.

Taken at Orilia the end of July, 1863; also at Cape Cottage, Portland, Maine, July 29th, 1861, and up to August 8th.

Stratiomis ischiaca, Harris.

At Cape Cottage, Portland, August 2nd, 1861.

Syritta proxima, Say.

Taken at Cape Cottage, Portland, on August 3rd, 1861.

Syrphus Ribesii, Fab.

Label lost, but I believe taken at Toronto.

Syrphus agnon, Walk.

At Toronto, in our garden, Nov. 10, 1861.

Eristalis inflexus, Walk.

Cape Cottage, Portland, July 22nd, 1961.

Eristalis sincerus, Harris.

At Toronto in 1860.

Eristalis nebulosus, Walk.

Label lost.

Conops sagittaria, Say.

Near Cape Cottage, Portland, July 24th, 1861. Two specimens.

Tachina finitima, Walk.

Cape Cottage, Portland, August 7th, 1861. Common.

Tachina apicifera, Walk.

College Avenue, Toronto, June 3rd, 1858. Cape Cottage, Portland, July 27th, 1861.

Tachina iterans, Walk.

Label lost. Probably Toronto.

——— ———? Sp.

At Orilia in August, 1863. Same size as *T. finitima*. Abdomen black, with a white spot at the side of each segment.

——— ———? Sp.

Bred from a chrysalis of some moth at Toronto, April 2nd, 1862. Rather smaller than the last species. Abdomen black, with somewhat obsolete white spots on side of each segment. Eyes reddish.

——— ———? Sp.

Somewhat like the last, but only half the size. Label lost.

——— ———? Sp.

Label lost. Same size as last. Wings iridescent; body black; eyes brownish red.

Chrysops carbonarius, Walk.

Taken at the Humber, Toronto, June 13th, 1863.

Asilus ——— ? Sp.

Cape Cottage, Portland, August 16th, 1861. A large species, measuring an inch and a quarter in length, and nearly an inch and a half in expanse of wings.

CORRESPONDENCE.

EXPLANATORY.

DEAR SIR,—

The following considerations have suggested themselves to me in reference to Mr. Herman Strecker's recent personal attacks. For myself I do not think that either Mr. Strecker's style or language can be defended on any ground. As to the matter, this is furnished by certain synonyms in my writings on North American moths. To those conversant with the subject, it is not necessary to point out the fewness of such mistakes, but it may have escaped notice that in nearly every instance I have been the first to correct the mistake, and thus Mr. Strecker's abuse has come *ex post facto* and proves itself wholly personal and unscientific. I take pleasure in referring here to words used in my earliest paper (Proc. Acad. Nat. Sci. Phil., 1862, p. 59). I think I have always lived up to my first statement, and where I have made a synonym, both "willingly and gladly" acknowledged it. And although I am charged by Mr. Strecker with allowing one mistake to remain "nineteen months" before correction, I can assure him that I still corrected it the moment I became aware that it existed. Certain of these mistakes have occurred in describing American species under distinct names. Sometimes these species have turned out to be the same with European forms, and a synonym has been the result. I do not think this the great misfortune which Mr. Strecker pretends, the less when we remember that in many instances the American specimens may be distinguished, and I have suggested that we shall lose a knowledge of these distinguishing points unless we use distinguishing names. Certainly these are occasions for quiet scientific observation, not in any case for unscientific vituperation. The difficulty of avoiding a giving of too great weight to a remote locality is even instanced by Mr. Strecker, who has re-described a ♀ *Cressonia juglandis* as a new species of *Smerinthus* from "Texas." The pale specimen, merely wanting the

median shade on the primaries, would, if caught, say in Reading, have hardly furnished one of Mr. Strecker's "coveted" novelties. Again, instances are on record where naturalists have first considered the American species the same as the European, and then changed their views and described them as distinct. An instance of this is offered by *Brephos infans*, first described as the same as the European *Brephos parthenias*. The amount of error is no greater in the one case than the other.

At the time that I commenced my labors, the difficulty of determining our species of moths was very great, certainly much greater than it is now. That this change is in part due to my work I think is true, equally so that Mr. Strecker is both unjust and ungrateful to omit the consideration from his mind. How much he himself is indebted to my labors may be seen by comparing my work on the genus *Catocala* with his own on the same subject. His figures and determinations are taken from the collection I studied and the paper I published; and, in reality, his figures merely supplement my original work. That Mr. Strecker has so generally coincided with me in his specific discriminations in the genus *Catocala*, is, I think, less a compliment to my correctness than a proof of Mr. Strecker's ready acceptance of assistance.

I have a few special remarks with which to conclude. I am blamed for retaining the name *C. ponderosa* instead of the earlier *C. nebulosa* || for a species of *Catocala*. From Linnæus to Lederer it has been customary to avoid the repetition of names in the same family of moths, and Gueneé has changed the name of a species of *Catocala* on account of an *Anarta* bearing the same specific title. I have never changed the name of another author on this account; my opinion (as, indeed, cited by Mr. Strecker) being that a fresh name is unnecessary. I have merely, where two names were attached to the same species, preferred the later when the earlier had been previously used. Whether my descriptions in the genus *Catocala* are the best, I will not dispute with Mr. Strecker; in his comments on *C. ponderosa* Mr. Strecker forgets that we figured the species, in justice to Mr. Wiest, the artist, I think very acceptably. Nor will I allow Mr. Strecker the proper authority to discuss the value of structural characters in the Lepidoptera, seeing that he has shown no experience in the matter, and is unable to discriminate even between the sexes of *Catocala* when the abdomen is wanting.

A. R. Grote.

SYNONYMICAL NOTE.

Dr. Boisduval has recently re-described *Eudryas grata* (Fabr.) from Georgia under the name *Eudryas assimilis*, with the remark: Cette belle espece n'a pas encore ete figuree. It is manifestly unimportant to Dr. Boisduval that the science of Entomology is pursued in America. In this same paper (Revue et Magasin de Zoologie, 1874) the genus *Alypia* is erroneously attributed to Kirby, and a citation is given: "*Sphinx octomaculata* Hubn. Zut., 119, 120." which does not exist, the proper citation being "*Alypia octomaculalis* Hubn., Zutr., No. 60, fig. 119, 120."

Dr. Boisduval separates Drury's figure of *Urania rhipheus* (1773) from Cramer's (1782), under the new name of *Urania Druryi*. This is, however, a simple synonym in any event, since Drury's species must retain the name of *Rhipheus* as originally proposed. Cramer himself says, when describing his *Rhipheus*, T. 3, p. 193, "Ce beau Papillon et qui est tres rare, ressemble beaucoup a' celui qui a ete annonce par Mr. Drury dans ses Illustrations of Natural History, Vol. 2, pl. 23, figs. 1, 2, *sous le nom que nous lui donnons ci-dessus.*" Guenée, in 1857, also draws attention to this mistake of Dr. Boisduval's, then only proposed to be committed. It has been generally conceded that Drury's species is the same as Cramer's, and that the differences in the figures arose from an intentional mutilation of Drury's original specimen. Dr. Boisduval's quotation from Lacordaire would hardly cover such a case as this, in which a pair of scissors very probably effected "la creation." To find another "taille sur le meme patron," would argue, then, a lack of conscience somewhere, as well as the sacrifice of a specimen. But Dr. Boisduval insists on other characters to separate the two species than the absence of the tails, i. e., the large size and the ornamentation of the fore wings of *Rhipheus* Drury. So in this case we should have two species, i. e., *Chrysiridia Rhipheus* (Drury) nec Hubn. (= *Urania Druryi* Boisd.) and *Chrysiridia Orientalis* (Swains) (= *Rhipheus* Cramer 385, A. B.; *Chrysiridia Rhiphearia* Hubn.)

A. R. GROTE.

Our usual acknowledgements of books received have been omitted for want of space, they will appear in our next.—ED. C. E.

The Canadian Entomologist.

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ANNUAL ADDRESS OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, 1874.

To the Members of the Entomological Society of Ontario :

GENTLEMEN,—I beg to offer you again, after the lapse of a year, my hearty congratulations upon the continued prosperity of our Society. As you have already learnt from the Report of our Secretary-Treasurer, we have been favored with a slight increase in our list of membership—as large, indeed, as can fairly be expected in a Society which confines itself to the study of a particular branch of Natural Science, and which cannot therefore attract into its ranks many who are not specially engaged, to some extent at least, in this limited field of investigation.

It is especially pleasing to find that our number of branches continues to increase—a highly successful one, with its headquarters in Montreal, having been organized since our last annual meeting. Its first annual report has been already presented to us in the pages of our journal.

The CANADIAN ENTOMOLOGIST, upon whose success the well-being and fair fame of our Society so largely depends, has—I am sure you will all agree with me—been more ably sustained than ever before. The thanks of the whole Society are assuredly due to the energetic and talented Editor, Mr. Saunders, who has been, indeed, its mainstay from the issue of its first number until now. It would be well if all our members would aid him, not only by contributions, but also by increasing the circulation, and thereby improving the means of support of the publication.

When I applied just now the term "limited" to our field of enquiry, I only did so when considering Entomology as one amongst a large number of sections of the great circle of natural sciences, which includes within its area the study of all things material which come within the range of man's intellectual powers. If we look, however, at Entomology and its objects alone, we cannot fail to see at once that it is practically

without limit—that there is work enough for thousands of investigators for almost innumerable generations to come. And when we couple with Entomology other kindred sciences, such as Botany, Geology and Physical Geography, which are so closely allied that no student can safely overlook them, we begin almost to be overwhelmed with the vast extent of this field of knowledge that we seek to explore. So vast, indeed, is the field that no one now ventures to survey the whole of it, except in a very general way; each explorer finds himself compelled—if he would do any effective work—to confine his labour to some one or two of its sections or subsections. By this division of labour, all departments of the Science will by degrees be taken up, and much that is now a '*terra incognita*' will become familiar to the patient explorer.

In our own country—within the bounds of this great Dominion—there is need of many more students and explorers. Even in this Province of Ontario, the headquarters of our Society, where more has been done than in any other part of Canada, there is yet room for a great increase to our band of collectors and investigators. How incomplete, for instance, is even yet our list of Diurnal Lepidoptera, and how many pages are still blank in the life history of some of our commonest butterflies? Our able Editor, my excellent friend, Mr. Saunders, has done much to fill up these blank pages, and his work is everywhere recognized as thorough and authoritative; but yet there remains much more to be done, that we hope our members will before long accomplish. If we turn to Crepuscular and Nocturnal Lepidoptera, we must feel almost appalled at the extent of our ignorance. For those who have the time and the ability, I can think of no more interesting or attractive field of enquiry—none that will sooner or better repay the pains-taking student, whether he looks for fame or pleasure, whether he sighs for fresh fields to conquer, or desires to set his foot where man has not trodden before. In a department where so much remains to be done, we all, I am sure, offer a most cordial welcome to one who has recently cast in his lot among us, and has traversed the broad Atlantic in order to study the Noctuidæ of this country. I allude to Mr. George Norman, of St. Catharines, late of Forres, in Scotland.

In another order of insects, the Coleoptera, much no doubt has been accomplished. Through the pains-taking labours of a Billings and a Pettit, not to mention other good workers, and by the aid of the great authorities in the neighbouring States, Dr. Leconte and Dr. Horn in particular, we have been able to increase our list of Canadian beetles from a few hundreds at the birth of the Society, to more than as many thousands

now. But still how very much more remains to be done? What a field of labour there is before both student and collector in the Carabidæ, the Staphylinidæ, the Curculionidæ and other numerous families of beetles! May we not hope that during the coming winter our present scattered stores of knowledge will be utilized and made available for the good of all, by the compilation and publication of a large addition to our old and valuable list of Canadian Coleoptera?

If there remains so much to be done in these two favorite orders, what shall I say of the remainder, that are so generally neglected? It is surely time that some of our members should devote themselves to the working up of such interesting orders as the Neuroptera, the Hymenoptera, the Orthoptera, the Hemiptera, even if no one can be found at present to take up the study of the more difficult Diptera.

In all these orders there is the nucleus of a collection in the cabinets of our Society, while no doubt much additional material would be furnished by individuals to any member who will take up in earnest the study of any one of them. It would be a great contribution to our knowledge of Canadian insects if there could be published by the Society carefully prepared lists of as many species as possible in each of these orders. Such lists would, of course, be very incomplete at first, but they could easily be so arranged in publication that additions might be made to them at any time, as our stores of knowledge increase.

Such, gentlemen, are some of the modes in which, I think, we should endeavour to extend the operations of our Society. If each year, when we assemble together for our annual meeting, we can point to some such work done in the previous twelvemonth, we shall have good reason to congratulate ourselves upon real permanent progress—upon building up the foundation of an Entomological structure that will prove enduring and substantial in time to come.

Thus far I have referred to Entomology as a purely scientific pursuit; there is another aspect in which we cannot refrain from regarding it, viz., as a subject of very great economic importance to every inhabitant of our land. This view of Entomology has been especially brought before us of late by the havoc that has been produced in our farms and gardens by hordes of destructive insects.

The dreaded Colorado Potato Beetle (*Doryphora decem-lineata*) has spread eastward with great rapidity, and has now reached the Atlantic coast in some parts of the United States. I have been informed by

friends who reside in various parts of the Union, that while little, if any, diminution in the numbers of the pest is to be observed in the west, it is becoming very destructive where it has attained to its second year of colonization. During the first year of its invasion of a particular locality, no appreciable damage is done by it, but as its armies increase in geometrical progression, the potato crops of the following season generally suffer to a terrible extent. It has now covered the whole of the Province of Ontario, and is very destructive throughout the western half of it, though we are happy to say that our intelligent farmers and gardeners are effectually using the remedies suggested by our colleagues, Messrs Saunders and Reed, in their Report to the Legislature a few years ago. In Quebec it is but beginning to be observed; no doubt it will be found there in myriads next year. Across the border, it has penetrated to the western portion of Vermont, into New Jersey, down to the sea coast in Pennsylvania, and in Maryland; at Baltimore, Md., it is very abundant, while straggling outposts have been found as far south as Washington. The whole of New York and Ohio have been pretty well covered with the insect, while in Missouri it is as abundant as ever. In Indiana and Michigan there is a local diminution in the numbers of the pest, but no where are there as yet any signs of its cessation. The people of Europe are now beginning—and with good reason—to feel alarmed at the prospect of its crossing the Atlantic. The English and French scientific and agricultural publications are commencing to publish notices of the insect and to talk of restrictive measures, while in Germany, we are told that stringent regulations will probably soon be put in force by the Government to prevent the invasion of the country. Unless some regulations of this kind are put in general force throughout the whole of Western Europe, I believe that—judging from the spread of noxious European insects on this side of the Atlantic—the Colorado Beetle will soon become there as familiar an object and as destructive a pest as it is here.

While the Colorado Beetle from the Rocky Mountains has been overspreading the whole northern continent eastward, there has been moving southward and westward in a similar manner another insect—the Cabbage Butterfly (*Pieris rapæ*)—that is almost as injurious as the other. This insect, an European importation, as of course you all know, starting from Quebec some few years ago—there first noticed by our friends, Messrs. Couper and Bowles—has now spread westward over almost the whole of Ontario. At Port Hope it has been this year by far the most common of all butterflies; thousands were to be seen throughout the whole

season, from early summer to the present time, flitting about along every road, and hundreds hovering over or alighting in every garden. There is hardly a cabbage or cauliflower fit to be eaten anywhere in the neighbourhood, while stocks and mignonette have been ruthlessly demolished in all the flower gardens. Its spread westward, however, has hardly been as rapid as its movements to the south. The two maritime provinces of New Brunswick and Nova Scotia, and all the New England States, have for some time been occupied, and now I am told that this year it is most plentiful as far south as Washington, and that it is by no means rare in Virginia.

While referring to the wonderful spread of noxious insects during the past few years, and to their excessive prevalence now, I must not omit to mention the affliction caused to our north-west Province of Manitoba and to many of the western States by the swarms of locusts, or grasshoppers as they are termed (*Caloptenus spretus*). The accounts of the sufferings caused by this terrible plague are perfectly appalling, and rival anything that we have read of the ravages of the Eastern locusts. Happily for us they do not seem to extend much further to the east than the Missouri River, though, occasionally they penetrate to some of the broad prairies beyond. As a detailed account of this insect will probably be afforded you in the forthcoming Annual Report of our Society, I need not detain you with any further remarks upon it.

The only other insect to which I need now call your attention for a moment, is the Grape-Vine *Phylloxera*. I am glad to learn that its ravages in the vineyards to the south of us have been comparatively trifling this year, and that in all probability the summer droughts to which we are so liable, will prevent its ever being as formidable a foe as was at one time apprehended.

To turn from this not very cheerful subject, I may mention, before concluding, that Mr. Saunders and myself duly attended the recent meeting at Hartford, Conn., of the American Association for the Advancement of Science. There we had the pleasure of meeting a large number of Entomologists from all parts of the United States, and we had the further gratification also, of being presided over, in general session, by the ablest of American Entomologists, Dr. Leconte, and in the Zoological Section, by another great worker in our department, Mr. S. H. Scudder. Informal meetings of Entomologists were frequently held, and finally it was agreed upon to form an Entomological Club of Members of the A.A.A.S., who should assemble annually a day before the meeting of the Association

in the place that may be from time to time selected for its sessions. In this way we trust that much may be done for the furtherance of our favourite branch of science, and that Entomologists generally, from all parts of the continent, will bring together their types of new species and the surplus of their collections for mutual information and benefit.

Without further trespassing upon your time and attention, I beg to thank you, gentlemen, for the kind consideration you have shown to my colleagues and myself during our term of office, and with hearty wishes for the continued prosperity of our Society,

I have the honour to be, gentlemen,

Your obedient servant,

CHARLES J. S. BETHUNE,

President E. S. of O.

Trinity College School, Port Hope, Sept. 22, 1874.

ON SOME CHANGES IN THE NOMENCLATURE OF NORTH AMERICAN COLEOPTERA, WHICH HAVE BEEN RECENTLY PROPOSED.

BY JOHN L. LECONTE, M. D., PHILADELPHIA.

Since the issue of the Check List of N. A. Coleoptera by the late Mr. G. R. Crotch, I have been asked by several persons interested in that branch of science, if I would advise them to change the labels in their collections in accordance with the nomenclature of several familiar genera as therein set forth. To all such applicants I have answered, that such changes are not expedient, unless they are fully convinced of the propriety of admitting them. For my part, I considered them quite unnecessary, and still further, contrary to the code of laws of nomenclature under which I supposed we were acting.

Circumstances, which it is unimportant for me to specify, have prevented me from heretofore making known the views upon which I formed the opinion thus given, but as confusion of ideas upon the adoption or non-adoption of Mr. Crotch's nomenclature now exists, I think that the time has now arrived for a full discussion of the subject.

For the purpose of confining attention to the more radical changes proposed, I will leave for a future time all questions relating to specific names, and consider at present only those affecting genera.

With the exception of some very unimportant examples, these chiefly turn upon the validity of the genera proposed and defined by Dr. Geoffroy in his Histoire Abregee des Insectes.

The first edition of this valuable work, in which, as is justly said by Mr. Crotch, he displayed "a degree of acumen far in advance of his age," bears date on the title page, 1764*, and was printed at Paris. The last edition, with supplements, was printed also in Paris, year of the Republic vii, (1799.)

The binominal nomenclature was first distinctly used in zoology in the 10th edition of the Systema Naturæ, by Linnæus, in 1758, and repeated in the 12th edition, 1766–67.

After the publication of the work last mentioned, Fabricius and others, devoting themselves more exclusively to entomology than Linnæus had done, divided his genera, and in describing new ones adopted other names for several of those described by Geoffroy.

The names of these later authors have, until the changes proposed by Mr. Crotch, been adopted without cavil.

Thus much as to the history of the question. Now as to the argument.

The most systematic attempt to reduce the laws of nomenclature in zoology to a code, capable of being easily understood and applied, was that of the British Association, acting through a committee, which reported at the meeting held in 1842.

Without discussing the details of this report, some of which might be and, indeed, were subjected to criticism, it is sufficient to state that the principles therein recommended were adopted by the Association, and without important modification, were reaffirmed by the Association of American Geologists and Naturalists at the meeting held in 1845.† These laws have been accepted and acted on by nearly all investigators in Natural History ever since.

Some discussions having taken place which indicated a possibility of improving the code, it was again referred by the British Association to

* Mr. Crotch states 1762, but I know not on what authority.

† Am. Journ., 2nd series, ii, 423—(1846).

a committee, which reported substantially the same rules, with a few closer definitions of moot points and some useful commentaries upon certain rules.

This report was adopted at the meeting in 1865, and was reprinted with notes by Prof. A. E. Verrill, in the American Journal of Science and Arts, 2nd ser., xlviii, 92, in 1869.

It would therefore appear that the common law under which Zoologists now act in questions of nomenclature, is the code, the history of which I have just given. The only other alternative is, that there are no established rules, and that in the Republic of Science each citizen is a judge, capable of expounding the law for himself, and amenable to no tribunal.

I will therefore assume that until a different code is formally adopted, American naturalists are disposed to abide by the recommendations of the two important scientific bodies, whose reports are above mentioned.

As the language of all three reports is equally clear and definite upon the points I wish to make against the reception of the Geoffroy'an genera, I shall quote from the latest, reprinted in Silliman's Journal, 1869, as being most easy of reference.

" Rule III. The committee are of opinion, after much deliberation, that the XIIth edition of the Systema Naturae is that to which the limit of time should apply, viz., 1766 "..... (p. 94.)

P. 96. "As our subject matter is strictly confined to the *binomial system of nomenclature*, or that which indicates species by means of two Latin words, the one generic, the other specific, and as this invaluable method originated solely with Linnaeus, it is clear that as far as species are concerned, we ought not to attempt to carry back the principle of priority beyond the date of the 12th ed. of the Systema Naturae, 1766. Previous to that period, naturalists were wont to indicate species not by a name comprised in one word, but by a *definition* which occupied a sentence, the extreme verbosity of which method was productive of great inconvenience."..... (p. 97.) "The same reasons apply to genera."..... " Brisson, who was a contemporary of Linnaeus and acquainted with the Systema Naturae, defined and published certain genera of birds which are *additional* to those in the 12th edition of Linnaeus' works, and which are therefore of perfectly good authority. But Brisson still adhered to the old method of designating species by a sentence instead of a word, and therefore while we retain his defined genera, we do not extend the same indulgence to the titles of his species, even when the latter are accidentally binomial in form."

By reference to the several editions of Geoffroy it will be seen, 1st, that he did not adopt the binominal nomenclature, except in regard to the additional species described in the supplements to the edition of 1799*; 2nd, that he did not admit himself any rule of priority in generic names, inasmuch as he described genera previously proposed by Linnæus under other names, quoting Linnæus in synonymy; 3rd, that he made no reclamation either in genera or species, in the last edition of his work.

It must also be kept in mind that Olivier and Latreille, cotemporaries and friends of Geoffroy, used his generic names only so far as they did not conflict with the genera established by other authors up to the date of their respective memoirs. They did not therefore 'revive' these names, as claimed by Mr. Crotch, but adopted them and introduced them into the proper and permanent literature of scientific terminology, thus placing them upon a new basis.

It would therefore appear, that notwithstanding the great value of the work of Geoffroy, and the importance of the views of classification which he proposed (and none will be more ready to admit the merit of his labors than myself,) he did, by an unfortunate want of appreciation of the necessity of adopting the Linnæan binominal nomenclature, and by not recognizing the principle of priority, exclude himself from being cited *either for genus or species* under the existing code, except so far as relates to the supplemental species in the edition of 1799.

In all other instances the names of his genera are free, and must be attributed to the authors who subsequently employed and defined them, either *with* or *without* reference to his use of the names.

In order that the evidence upon which I have based my opinion may be readily accessible, I have appended the remarks of Mr. Crotch upon the priority of his names, and two tables, one of synonyms, the other of homonyms of all the Coleopterous genera defined by Geoffroy.

In conclusion, I would recommend to those who use the Check List to substitute for the generic names adopted from Geoffroy in that work, the following, which have been in current use:

P. 37.—*Peltis* Geoffr. to SILPHA Linn., and change *Silpha* to NECROPHORUS Fabr. Fabricius was the first to divide the Linnaean

* An abridgment of his work under the name of ——Fourcroy, with binominal nomenclature, was issued in 1785, and must be taken, therefore, as the earliest date for his species.

Silpha into two genera. The idea of type species, now commonly (though by no means universally adopted), did not then exist, and consequently it was competent for Fabricius to determine for which part of the genus he would retain the original name. If it was for the part corresponding with Geoffroy's *Peltis*, the latter must sink. Fabricius' *Necrophorus*, as will be seen in the table, is contained in *Dermestes* Geoffroy.

P. 42.—Change *Tritomidæ* to MYCETOPHAGIDÆ, and *Tritoma* to MYCETOPHAGUS Hellw., or else cite the name *Tritoma* from Fourcroy, 1785. The name in this sense should, in my opinion, be suppressed, as it was founded on a false character, and should not have been separated by Geoffroy from his *Dermestes*.

P. 79.—Change *Clerus* Geoffr. to TRICHODES Herbst., and *Thanasimus* Latr., so far as it relates to the 1st division of the genus, to CLERUS Fabr. Herbst first divided the genus as established by Geoffroy, and adopted by Fabricius, and therefore had the right to apportion the names to the divisions he founded.

P. 88.—*Stenocorus* Geoffr. The same reasoning would change this name to RHAGIUM Fabr.; the latter author having divided *Stenocorus*.

P. 51.—Change *Cistelidæ* to BYRRHIDÆ, and p. 52, *Cistela* to BYRRHUS Linn.

P. 93.—Change *Spermophagidæ* to BRUCHIDÆ, and *Mylabris* Geoffr. to BRUCHUS Linn.

P. 105.—Change *Tenebrionellus* Cr. to TENEBRIO Linn. *Tenebrio* Geoffr. is considered by Mr. Crotch to have *Asida* as its type, and therefore the change was proposed by him for the genus, as restricted by Fabricius, who first commenced its division into several genera. The same reason here applies as in several of the preceding instances.

P. 107.—Though not connected with the present subject, I may remark that the change of ULOMA to *Phaleria*, and of PHALERIA to *Halophalerus* Cr., has been produced by the assumption of generic types for the genera of authors who would certainly have repudiated the idea, had it been proposed to them. *Phaleria* Latr. was founded on three species, now belonging to different genera, and in course of time, and by the will of those who divided the genus, the 1st species has gone back to the previously established genus *Gnathocerus*, the 2nd became *Uloma* and the 3rd retained the name *Phaleria*.

P. 108.—Change *Pseudocistela* Cr. to CISTELA Fabr.

P. 115.—Cantharis *Linn.* should read *Geoffr.* The table of synonyms of Geoffroy's genera will show that by adhering to the received code of laws of nomenclature, the name CANTHARIS *Linn.* should be restored to some genus of Telephoridae which contains Linnaean species. Of these perhaps *Podabrus* would be the most convenient, while for the blistering flies, a dismemberment of *Meloe* Linn., the name proposed by Fabricius, LYTTA, must be adopted.

Remarks of Mr. Crotch on the Genera of Geoffroy, Trans. Ent. Soc. London, 1870, 43:

"1762. Geoffroy, in his Histoire Abregee, divides the Coleoptera into 50 genera, displaying a degree of acumen far in advance of his age, which was but little appreciated by his contemporaries; the ill-concealed jealousy of Linnaeus is only too evident in his 12th edition; Olivier and Latreille succeeded in restoring the majority of Geoffroy's names, but there are still several which must be adopted. . . . *Platycerus* and *Peltis*, often attributed to Geoffroy, must either be rejected as synonyms, or, if allowed to remain, be quoted from Latreille and Illiger, who revived them. The others ought to be all retained."

Table of Synonyms of Geoffroy's Genera.

1764.	1767.	1775.	1789.	1796–1806.
GEOFFROY.	LINNÆUS.	FABRICIUS.	OLIVIER.	LATREILLE.
1. Platycerus	Lucanus	Lucanus	Lucanus Trogossita	Lucanus Trogosita Platycerus
2. Ptilinus	Ptinus	Hispa	Ptilinus Drilus	Ptilinus Drilus
3. Scarabæus	Scarabaeus	Scarabaeus Cetonia Trichius Trox Melolontha	Scarabaeus Cetonia Trox Melolontha	Scarabaeus Cetonia Trichius Trox Melolontha Aphodius Geotrupes Oryctes Hoplia
4. Copris	Scarabaeus	Scarabaeus	Copris	Copris Ateuchus

1764.	1767.	1775.	1789.	1796–1806.
GEOFFROY.	LINNÆUS.	FABRICIUS.	OLIVIER.	LATREILLE.
				Sisyphus
				Onthophagus
5. Attelabus	Hister	Hister	Hister	Hister
6. Dermestes	Dermestes	Dermestes	Dermestes	Dermestes
	Silpha	Necrophorus	Necrophorus	Necrophorus
		Tritoma	Ips	Ips
			Dryops	Dryops
		Sphaeridium	Sphaeridium	Sphaeridium
		Elophorus	Elophorus	Elophorus
		Nitidula	Nitidula	Nitidula
7. Byrrhus	Ptinus	Anobium	Anobium	Anobium
	Dermestes			
8. Anthrenus	Byrrhus	Anthrenus	Anthrenus	Anthrenus
9. Cistela	Byrrhus	Byrrhus	Byrrhus	Byrrhus
10. Peltis	Silpha	Silpha	Silpha	Silpha
				Choleva
11. Cucujus	Buprestis	Buprestis	Buprestis	Buprestis
12. Elater	Elater	Elater	Elater	Elater
				Throscus
13. Buprestis	Carabus	Carabus	Carabus	Carabus
	Cicindela	Cicindela	Cicindela	Cicindela
		Elaphrus	Elaphrus	Elaphrus
				Loricera
				Panagaeus
				Bembidium
				Harpalus
				Brachinus
				Lebia
14. Bruchus	Ptinus	Ptinus	Ptinus	Ptinus
				Gibbium
15. Lampyris	Lampyris	Lampyris	Lampyris	Lampyris
		Pyrochroa		
16. Cicindela	Cantharis	Cantharis	Telephorus	Telephorus
		Malachius	Malachius	Malachius
		Necydalis	Oedemera	Oedemera
				Dasytes
17. Omalysus			Omalisus	Omalisus
18. Hydrophilus	Dytiscus	Hydrophilus	Hydrophilus	Hydrophilus
19. Dyticus	Dytiscus	Dytiscus	Dytiscus	Dyticus
				Hyphydrus
				Haliplus
20. Gyrinus	Gyrinus	Gyrinus	Gyrinus	Gyrinus

1764.	1767.	1775.	1789.	1796–1806.
GEOFFROY.	LINNÆUS.	FABRICIUS.	OLIVIER.	LATREILLE.
21. Melolontha	Chrysomela	Cryptocephalus	Clytra	Clythra
22. Prionus	Cerambyx	Prionus	Prionus	Prionus
23. Cerambyx	Cerambyx	Cerambyx	Cerambyx	Cerambyx
24. Leptura	Leptura	Lamia	Necydalis	Lamia
	Cerambyx	Saperda	Saperda	Cerambyx
	Necydalis	Callidium	Callidium	Prionus
25. Stenocorus	Cerambyx	Stenocorus	Stenocorus	
	Leptura	Leptura	Leptura	Leptura
		Donacia	Donacia	Donacia
		Rhagium		
26. Luperus			Luperus	
27. Cryptocephalus	Chrysomela	Cryptoceph.	Cryptoceph.	Cryptoceph.
			Eumolpus	Eumolpus
28. Crioceris	Chrysomela	Crioceris	Crioceris	Crioceris
	Hispa	Hispa	Hispa	Orsodacna
29. Altica	Chrysomela	Altica	Altica	Altica
30. Galeruca	Chrysomela	Crioceris	Galeruca	Galeruca
31. Chrysomela	Chrysomela	Chrysomela	Chrysomela	Chrysomela
				Prasocuris
32. Mylabris	Bruchus	Bruchus	Bruchus	Bruchus
33. Rhinomacer	Attelabus	Attelabus	Attelabus	Attelabus
			Rhynchites	Rhynchites
			Apion	Apion
			Apoderus	
34. Curculio	Curculio	Curculio	Curculio	Curculio
				Calandra
				Brachyrhinus
				Lixus
				Cionus
35. Bostrichus	Dermestes	Bostrichus	Bostrichus	Bostrichus
				Anthribus
36. Clerus	Dermestes	Clerus	Clerus	Clerus
	Attelabus	Notoxus	Necrobia	Necrobia
		Dermestes		Thanasimus
				Opilus
				Anthribus
37. Anthribus	Dermestes	Curculio	Anthribus	Anthribus
		Bruchus	Macrocephalus	
38. Scolytus		Bostrichus	Scolytus	Scolytus
39. Cassida	Cassida	Cassida	Cassida	Cassida
40. Anaspis	Mordella		Mordella	Anaspis
41. Coccinella	Coccinella	Coccinella	Coccinella	Coccinella

1764.	1767.	1775.	1789.	1796–1806.
GEOFFROY.	LINNÆUS.	FABRICIUS.	OLIVIER.	LATREILLE.
42. Tritoma	Chrysomela		Mycetophagus	Mycetophagus
43. Diaperis	Chrysomela	Chrysomela	Diaperis	Diaperis
44. Pyrochroa	Lampyris	Pyrochroa	Pyrochroa	Pyrochroa
	Cantharis			
45. Cantharis	Meloe	Lytta	Cantharis	Cantharis
	Necydalis	Necydalis	Oedemera	Oedemera
			Lagria	Lagria
				Sitaris
46. Tenebrio	Tenebrio	Tenebrio	Tenebrio	Tenebrio
	Silpha	Opatrum	Opatrum	Opatrum
		Blaps	Blaps	Blaps
		Helops	Helops	Helops
		Cistela	Cistela	Cistela
				Asida
				Pedinus
47. Mordella	Mordella	Mordella	Mordella	Mordella
			Cistela	Cistela
48. Notoxus	Meloe	Notoxus	Notoxus	Notoxus
49. Cerocoma	Meloe	Cerocoma	Cerocoma	Cerocoma
50. Staphylinus	Staphylinus	Staphylinus	Staphylinus	Staphylinus
		Paederus	Paederus	Paederus
		Oxyporus	Oxyporus	Oxyporus
51. Necydalis	Cantharis	Cantharis	Telephorus	Malthinus
52. Meloe	Meloe	Meloe	Meloe	Meloe

Notes to Table of Synonyms:

1, Trogosita *Fabr.;* 3, Geotrupes *Fabr.;* 4, Ateuchus Fabr.; 6, Lyctus *Fabr.;* Parnus *Fabr.;* Dryops *Latr.;* 7, Dermestes *Fabr.;* 13, Brachinus *Fabr., Weber;* 15, Lycus *Fabr.;* 16, Telephorus *Schæffer*, 1766; Dasytes *Fabr.;* 17, Omalysus *Fabr.;* 19, Hydrachna *Fabr.;* 21, Clytra *Laicharting*, 1781; 24, Prionus *Fabr.;* 26, Crioceris *Fabr.;* Ptinus *Fabr.,* 27, Eumolpus *Fabr.;* 28, Lema *Fabr.;* 29, adopted by Fabr. in Syst. Ent., 1775; transferred to Galleruca in Ent. Syst., 1792; some of the species also under Crioceris and Chrysomela; 30, Galleruca *Fabr.;* 32, the name Bruchus was adopted by Linnaeus from Kalm.; 34, Lixus and Calandra *Fabr.;* 35, Fabricius referred *capucinus* to Bostrichus in 1775, but in 1792 transferred it to Apate; 36, Clerus *Latr.*=Trichodes *Herbst, Fabr.;* 38, Eccoptogaster *Herbst.;* 40, Mordella *Fabr.;* 42, Ips *Fabr.*, Mycetophagus *Fabr.;* 43,

Diaperis, Hispa *Fabr.;* 45, Lagria *Fabr.;* 48, Notoxus *Fabr.*, 1782, Anthicus *Fabr.*, 1801 ; 50, several of Gravenhorst's genera, also adopted by Latreille.

These notes are not intended to give in all instances the authority by whom the additional names of genera were first proposed, but only to show their use by the authors quoted.

Table of Homonyms of Geoffroy's Genera, with their Reference to Modern Families :

1. Platycerus ; Lucanide. Lucanide (*Latr.*)
2. Ptilinus ; Ptinide. Ptinide (*Oliv., Latr.*)
3. Scarabaeus; Scarabaeide. Scarabaeide (*Linn., &c.*)
4. Copris ; Scarabaeide. Scarabaeide (*Oliv., Latr.*)
5. Attelabus ; Histeride. Curculionide (Linn., &c.)
6. Dermestes ; Dermestide. Dermestide (Linn., &c.)
7. Byrrhus ; Ptinide. Byrrhide (Linn., &c.)
8. Anthrenus ; Dermestide. Dermestide (*Fabr., Oliv., Latr.*)
9. Cistela ; Byrrhide. Cistelide (*Fabr., Oliv., Latr.*)
10. Peltis ; Silphide. Trogositide. (")
11. Cucujus ; Buprestide. Cucujide. (")
12. Elater ; Elateride. Elateride (*Linn., &c.*)
13. Buprestis ; Carabide. Buprestide (*Linn., &c.*)
14. Bruchus ; Ptinide. Bruchide (*Linn, &c.*)
15. Lampyris ; Lampyride. Lampyride (*Linn., &c.*)
16. Cicindela ; Telephoride. Cicindelide (*Linn., &c.*)
17. Omalysus ; Lycide. Lycide (*Oliv., Latr.*)
18. Hydrophilus ; Hydrophilide. Hydrophilide (*Fabr., Oliv., Latr.*)
19. Dytiscus ; Dytiscide. Dytiscide (*Linn., &c.*)
20. Gyrinus ; Gyrinide. Gyrinide (*Linn. &c.*)
21. Melolontha ; Chrysomelide. Scarabaeide (*Fabr., Oliv., Latr.*)
22. Prionus ; Cerambycide. Cerambycide (*Fabr., Oliv., Latr.*)
23. Cerambyx ; Cerambycide. Cerambycide (*Linn., &c.*)
24. Leptura ; Cerambycide. Cerambycide (*Linn., &c.*)
25. Stenocorus ; Cerambycide. Cerambycide (*Fabr., Oliv., Latr.*)
26. Luperus ; Chrysomelide. Chrysomelide (*Oliv.*)
27. Cryptocephalus ; Chrysomelide. Chrysomelide (*Fabr., Oliv., Latr.*)

28. Crioceris; Chrysomelide. Chrysomelide (*Fabr., Oliv., Latr.*)
29. Altica; Chrysomelide. Chrysomelide (*Fabr., Oliv., Latr.*)
30. Galeruca; Chrysomelide. Chrysomelide (*Oliv., Latr., Fabr.*)
31. Chrysomela; Chrysomelide. Chrysomelide (*Linn., &c.*)
32. Mylabris; Bruchide. Meloide (*Fabr., Oliv., Latr.*)
33. Rhinomacer; Attelabide. Rhinomaceride *(Latr.)*
34. Curculio; Curculionide. Curculionide (*Linn., &c.*)
35. Bostrichus; Bostrichide. Bostrichide (*Oliv., Latr.*) Scolytide (*Fabr.*)
36. Clerus; Cleride. Cleride (*Fabr., Oliv., Latr.*)
37. Anthribus; Anthribide. Anthribide, *Oliv., Latr.*
38. Scolytus; Scolytide. Scolytide (*Oliv., Latr.*) Carabide, *Fabr.*
39. Cassida; Chrysomelide. Chrysomelide *(Linn., &c.)*
40. Anaspis; Mordellide. Mordellide (*Latr.*)
41. Coccinella; Coccinellide. Coccinellide *(Linn., &c.)*
42. Tritoma; Mycetophagide. Erotylide *(Fabr., &c.)*
43. Diaperis; Tenebrionide. Tenebrionide (*Oliv., Latr.*)
44. Pyrochroa; Pyrochroide. Pyrochroide *(Fabr., Oliv., Latr.)*
45. Cantharis; Meloide. Meloide *(Oliv., Latr.)* Telephoride (*Linn., Fabr.*)
46. Tenebrio; Tenebrionide. Tenebrionide *(Linn., &c.)*
47. Mordella; Mordellide. Mordellide *(Linn., &c.)*
48. Notoxus; Anthicide (*Fabr., Oliv., Latr.*) Cleride, *Fabr.*
49. Cerocoma; Meloide. Meloide *(Fabr., Oliv., Latr.)*
50. Staphylinus; Staphylinide. Staphylinide *(Linn., &c.)*
51. Necydalis; Telephoride. Cerambycide *(Linn., Oliv., Fabr.)* Oedemeride *(Fabr.)*
52. Meloe; Meloide. Meloide (*Linn., &c.*)

DISCREPANCIES IN RECENT LISTS OF LEPIDOPTERA.

BY W. F. KIRBY, ENGLAND.

The opponents of the law of priority in nomenclature have taken occasion, both in England and America, to argue against the restoration of obsolete names, on the ground that the names employed in my Catalogue of Diurnal Lepidoptera do not always harmonize with those used in Staudinger's Catalogue of European Lepidoptera. Although this

argument looks plausible at first sight, a little reflection will probably convince many that it is baseless. We may leave genera out of the question now, as Staudinger has not attempted to grapple with the difficulties which they present; but as regards species, it must be remembered—1st, that Staudinger starts from 1758, instead of 1767, and that I should have done the same had I investigated the question fully when I commenced my work; and 2nd, that Staudinger, working at European Lepidoptera only, was necessarily better acquainted with the special literature relating to them than myself. Had I selected 1758, and possessed Werneburg's Beitrage zur Schmetterlings kunde at the time I was writing my own Catalogue, or had Staudinger's new Catalogue been published in time for me to verify the references contained in it, I think I may say that many of the alleged discrepancies would have disappeared, although, in some cases, I may have made use of materials which Staudinger does not appear to have employed, or may have seen reason to disagree with him as to the determination of certain species. Unless two authors have exactly the same materials to work with, or one copies from the other, no rules will be sufficient to insure their absolute agreement in *every* case; but by the strict law of priority, the chances of disagreement are reduced to a minimum.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 170.)

ANTISPILA.

A. ampelopsisella. N. sp.

In the preceding paper on this genus I mentioned that I had found the larva of this species mining the leaves of *Ampelopsis quinquefolia*. Since that paper was placed in the hands of the Editor, many months ago, I have succeeded in rearing it from the mine.*

* The specimen mentioned in that paper as having been bred from the Longworth grape-vine, is now too much denuded for satisfactory comparison with this species, but I believe it to be the same; certainly it is not any of the other known American species, and I have never met with it except in the Longworth grape leaf.

It is much smaller than any of the previously described species of this country, measuring only $\frac{3}{16}$ of an inch *alar ex.*, whilst *cornifoliella* is larger $\frac{1}{4}$, *Isabella* a little larger still, and *Viticordifoliella* is scant $\frac{1}{4}$. But it differs still more decidedly by having an almost lunate, rather large snow-white streak extending along the base of the dorsal ciliae nearly to the apex.

The distinctions between the described American species are as follows: The fascia and dorsal spot in *isabella* are wider than in *cornifoliella*. *Isabella* has the palpi white and the anterior feet yellowish, with brown annulations. Dr. Clemens is in error when he says that it is without violet and greenish reflections; I find it shows them about as in *cornifoliella*. In all the species I should call the fascia silvery rather than golden, though it certainly is tinged with golden? *Isabella* has the antennæ brown, with faint purplish reflections in some lights; the basal joint is pale ochreous yellow, but the terminal joint is of the general hue. In *cornifoliella* the stalk appears a little darker, and the terminal joint is white. The head in *isabella* can scarcely be said to be golden, as Dr. Clemens describes it, but has metallic hues; it appears to be like the fascia, silvery tinged with golden, though in some lights it appears to be brown. I have not been able to detect any appreciable differences between the fore feet of these two species. The face of *cornifoliella* is more decidedly brown and less metallic than that of *isabella*, and the palpi are somewhat darker.

The most striking differences are in the size and form of the fascia. *Viticordifoliella* differs from both *isabella* and *cornifoliella* in the fascia, which, however, resembles that of *isabella*, except that it is narrower on the costa. The costal and dorsal white spots in *viticordifoliella* are much more nearly regular triangles than in the other two species, in which they approach the trapezoidal form, and the costal spot is relatively smaller than the dorsal and a little further back, but the most striking difference is that the wings of *viticordifoliella* are more of a dead brown hue, the violet and bronzy green reflections being much less distinct. Its anterior tarsi are silvery white, and the head and palpi silvery tinged with yellowish. *Ampelopsiella* has the palpi white; face and head silvery, the face with a blue tinge; antennæ dark purple brown, with the tip white; fascia much as in *cornifoliella;* costal and dorsal spots rather as in *viticordifoliella*, but its most distinguishing mark is the curved white spot or streak along the dorsal ciliæ.

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The annual meeting of the above society was held (by the kind permission of the Provost) in the library of Trinity College, Toronto, on the 23rd of September, at 3 : 30, p. m. The report of the Secretary-Treasurer was presented, showing a slight increase of membership and a satisfactory condition of the finances, after which the President read his annual address, which was, by request of those present, kindly placed at the disposal of the Printing Committee for publication.

The following officers were then elected :—

President, Rev'd C. J. S. Bethune, M. A., Port Hope ; Vice-President, R. V. Rogers, Kingston ; Secretary-Treasurer, J. H. McMechan, London ; Council—E. Baynes Reed, W. Saunders, Rev'd G. M. Innes, J. M. Denton, London ; G. J. Bowles. Montreal. Editor of ENTOMOLOGIST, W. Saunders. Editing Committee—Rev'd C. J. S. Bethune, M. A.; E. Baynes Reed ; J. G. Bowles. Library Committee—W. Saunders, E. Baynes Reed, J. H. McMechan. Auditors—Chas. Chapman and J. H. Griffiths, London.

CORRESPONDENCE.

BRIEF NOTICE OF MR. STRECKER'S LAST ISSUE (NO. 10.)

The number bears the date of May, but its issue is certainly later, copies having been sent to subscribers in August ; its exact date is therefore uncertain. It contains brief descriptions of some supposed new species of moths, besides its curious account of North American Lycænæ, and pretty plate. The description of *Macroglossa fumosa* is in so far objectionable as Mr. Strecker is ignorant that all the allied species have, on emerging from the pupa, a light clothing of scales on the pellucid portion of the wings (see Ann. N. Y. Lyc., Vol. 8, and Lintner's N. Y. State Reports) which is easily brushed off.

Sphinx eremitoides is very probably *S. lugens* Walk.

Catocala magdalena is *C. illecta* Walk. (my No. 37).

Catocala aspasia is apparently *C. Arizonæ*, the description, so far as it goes, corresponding, with allowances for Mr. Strecker's "scarlet" hind wings.

A. R. GROTE.

PURCHASE OF INSECTS.—It often happens that an Entomologist is at a loss to procure specimens of certain rare species that he desires for purposes of study or to complete a series in his cabinet; he has seen them, perhaps, in the collection of a friend, or read of them in some publication, but is unable to obtain them for himself. We are glad to find that a provision has been made for such cases by the establishment of the "Philadelphia Agency" for the sale of specimens of insects; it is under the management of Mr. J. H. Ridings (518 South 13th Street,) and is evidently in close connection with the American Entomological Society. The Agency not only sells to purchasers, issuing price-lists of species from time to time, but also receives and disposes of collections from individuals upon commission. The names, moreover, of all insects sold by the Agency are guaranteed to be correct. We would recommend any of our friends who desire to procure rare and beautiful specimens, to send to the Agency for a price-list.

BOOKS RECEIVED.

On the Noctuidæ of North America, by Aug. R. Grote; from the 6th Report of the Peabody Academy of Science, Salem, Mass., 1874, pp. 18.

Descriptions of New North American Phalænidæ and Phyllopoda, by A. S. Packard, jr., ibid, pp. 19.

On the Transformations of the Common House Fly, with notes on allied forms, by A. S. Packard, jr. M. D.; from Proc Boston Soc. Nat. Hist., Feb., 1874, pp. 16, one plate.

Bulletin of the Buffalo Society of Nat. Sciences, Vol. ii, Nos. 1, 2 and 3.

Proceedings of the Boston Society of Natural History, vol. xvi, part iii, Jan. & Feb., part iv, Feb. to April, 1874.

Report of the Department of Agriculture, Washington, June to October.

Proceedings of the Convention of the American Association of Breeders of Short Horns.

Proceedings of the Academy of Natural Sciences of Philadelphia, October—December, 1873, and Jan., Feb. and March, 1874.

Report of the Council of the Agricultural and Arts Association of Ontario for 1873; Prize List of do for 1874.

Additions to the Library of the Linnæan Society, London, Eng., pp. 25.

The Observer of Nature, Lawrence, Kansas, vol. i, Nos. 1 and 2.

Entomology in Missouri, by Prof. C. V. Riley, from the American Naturalist, March and April, 1874, pp. 10.

The Zoologist and Newman's Entomologist, May to September; from Mr. Reeks.

Science Gossip to September.

Nature to Oct. 1.

The Horticulturist, N. Y., to Aug.

The American Agriculturist to July.

The Prairie Farmer, Chicago.

The Canada Farmer, Toronto, to July 15.

The Maine Farmer, Augusta, Me.

The Journal of Education, Toronto, to July.

The Indiana Farmer, Indianapolis.

Le Naturaliste Canadien, Quebec, to July.

Journal of Education to Sept., 1874.

The Canadian Entomologist.

VOL. VI. LONDON, ONT., NOVEMBER, 1874. No. 11

ON ENTOMOLOGICAL NOMENCLATURE.

BY JOHN L. LECONTE, M. D., PHILADELPHIA.

Part I—On the Law of Priority.

Im Ganzen—haltet euch an Worte ! GOETHE.*

The discussions upon the subject of nomenclature in Zoology, and especially in the department of Entomology, have recently become very perplexing to American students. Many who have been unable either by want of time or lack of opportunity, to consult old works, which are to be found in but few libraries, are called upon suddenly to decide for themselves, whether they will or will not adopt changes in the names of some of the most familiar and best known objects.

To all such I have but two words of advice : *Resist innovation*, unless the innovator presents to you the reasons for his proposed change, with such force as to convince your judgment. Disregard the Mephistophelean counsel, in the motto above cited. Use the *words* only to acquire and convey accurately your knowledge of *things ;* but never believe that the word is superior to the thing which it represents. Thus will you avoid scholasticism, one of the great abysses of thought into which the seeker after truth is liable to fall.

With a view to guide the thoughts of those of my readers who have paid heretofore but little attention to this very troublesome subject, in such manner that they may be able to form independent opinions, I have endeavored in this essay to place briefly before them the canons upon which all action in regard to nomenclature are at the present time supposed to be based. And to these canons I have appended short

* *On words* let your attention centre. B. Taylor's Faust, i, 110.

commentaries on the method in which I think they should be executed, in order that we may arrive at permanent and unchangeable results. These canons, as I would express them, are as follows:

1. The binominal system of nomenclature is the only one to be recognized: one word for the genus, and another for the species, to indicate each object.

2. Linnæus was the author of the binominal system.

3. The law of priority must be adhered to, so far as the interests of science make it practicable.

This law renders inviolable the name of every species which has been properly published, and the name of every genus properly defined and exemplified by one or more species.

4. The great number of the organic beings subjected to study has made it necessary, in order to avoid confusion, to increase the binominal name by adding the authority upon which the name either in whole or part rests.

5. In the formation of new names, reference is to be had to classical construction and to the ordinary proprieties of social intercourse.

Since the binominal system is of modern invention, being indeed scarcely more than a century old, and was only gradually introduced even by its author, it is obvious that none of these fundamental canons existed in the minds of the founders of Zoology, and that the appreciation of the necessity of such ordinances has become apparent only in consequence of the confusion occasioned by their non-existence.

The old codes of rules, Philosophia Botanica of Linnæus, and its imitation, Philosophia Entomologica of Fabricius, do not cover many of the most perplexing cases which have since arisen under these four rules, although, if acted on in good faith, they would have prevented much of the confusion since produced.

Concerning the two old codes I have at present nothing to say, the exhaustive commentary on the rules of Linnæus in the introduction to the Nomenclator Zoologicus of Agassiz, leaving, in fact, nothing to be desired.

It is therefore apparent that in applying the four canons, their influence must, like all retro-active laws, commence at certain arbitrary periods, to be determined, not by the judgment of individual investigators, but by

the same authority which fixes the principles themselves, that is: the common consent, expressed in a more or less formal manner, of the majority of those engaged in systematic study relating to the improvement of classification.

Now, the 1st and 2nd canons have been already put in execution by the rule adopted by the British Association, and reaffirmed by the Association of American Naturalists and Geologists, as follows:

"Rule III. The Committee are of opinion, after much deliberation, that the XIIth edition of the Systema Naturæ is that to which the limit of time should apply, viz., 1766."

This rule was adopted after much discussion regarding the respective claims of the 10th and the 12th edition to be considered as the basis of the system, and I think for wise and sufficient reasons. However that may be, there is no room now for individual difference of action; it is a law, and must be obeyed by all good citizens in the Republic of Science, until modified or abrogated by an authority equal to that which enacted it.

The third canon respecting the law of priority is also formulated in several rules of the British and American code, but in such manner as to render its application somewhat difficult. The following considerations seem to me of sufficient importance to require a definite decision, when the next opportunity occurs for formal action.

1. It is obvious, on an examination of the works of the earlier authors in Entomology, that they did not attach the same value to the fixity of nomenclature that circumstances have since rendered necessary. Linnæus changed apparently without cause several of the specific names from the 10th to the 12th edition. Previous to that time, he used the generic names in different senses, in different editions, without any explanations. Geoffroy described genera without reference to genera previously established by Linnæus. Fabricius did the same with regard to Geoffroy, and also in some instances changed his genera from 1775 to 1787, without reason, or even reference to the earlier name.

It is not until we come to Olivier that we find in Entomology the law of priority appearing; and not then as a matter of principle, so much as a courtesy due to the earlier describer.

I would therefore respectfully submit, 1st, that a rigorous application of the law of priority to those authors who did not act in accordance with it, will lead to much confusion; and it would probably be better, in all

doubtful cases, to restrict its operation to the time since the commencement of Olivier's part of the Encyclopedie Methodique, and to accept his decision as final on all cases up to that time, in the same way that the 12th edition of Linnæus is accepted as final on the question of binominal nomenclature.

2. If the authors anterior to the 12th edition are ruled out because of the imperfection of the binominal method up to that time, it would surely be consistent to exclude those after that time who failed to recognize its necessity. Species cannot, of course, be cited from them, for they gave no specific names; but I will go farther, and say that genera ought not to be attributed to them, except so far as to quote them in synonymy for their generic ideas, which were brought into harmony with the system of nomenclature by subsequent authors. They will live in the literature of the science in synonymy, but they have taken no part in the formation of the names of the objects, by which alone we know them and can speak of them, and therefore should not appear as authorities.

The proper application of the fourth canon is attended with still greater difficulty, and I fear that the two sets of opinions regarding the authority to be placed after the binominal name are absolutely irreconcilable. The arguments in favor of the original describer of the species on the one hand, and of the author of the binominal combination adopted on the other hand, are equally strong, perhaps, as regards the convenience of science, and each side has been argued with the utmost ability. I have therefore nothing to say on the subject in the way of argument, and suspect that for some time it must be left to the discretion of each student to decide under which system he can work best. Practically I do not regard it as a matter of any consequence, if each person will *distinctly declare* in his work *which system* he uses. The number of instances in which any confusion can result are few, and the synonymy in catalogues which are always at hand will at once resolve the doubt.

I may be permitted to observe, however, that clearer views of the respective merits of the two methods would prevail, and possibly even some harmonious result more speedily be obtained, if the arguments involved less discussion of purely personal interests. It would seem from some expressions of opinion I have seen, but which I forbear to refer to more definitely, that there are those that believe that one main object of descriptive natural history is to give the authors a sort of proprietary

interest in the species to which they affix names. The two methods of reference to authors would lead, therefore, on the one hand, to hasty and vague descriptions of species, on the other to arbitrary and unnecessary changes in genera. Such ideas are really aspersions on the motives of the great professors of unremunerative labor, upon whom science chiefly depends for her advancement. The good and true laborers are many; the small and mean minds, who feel honored at being quoted even in synonymy, are few. I think, therefore, that the harm to be done by adhering to either of the two methods is greatly exaggerated.

I would prefer to believe that the somewhat passionate line of argument occasionally indulged in, arises rather from a mental fault which is too common in this age, which prevails in all classes and in all pursuits —the undue importance given to the claiming of supposed rights, over the performance of fixed and definite duties. Of clamor for rights, even in countries where there is no oppressing class, we hear a great deal; of appeals for the rigid keeping of obligations we hear very little.

It is the privilege, with the facilities for publication now afforded by learned societies, of every careful observer of nature to contribute valuable material for the progress of the branch of science which he is capable of cultivating. *It is his duty* to put his contributions to knowledge in such a form as to be most easily available to his brothers in science. Whether his name remains connected permanently with his observation or not is a matter of small importance; he has done his duty in increasing the power of work of his colleagues.

In this connection I would observe that it is only in descriptive Natural History, the lowest and most routine work that a man of science has to perform, that any association of names with results is possible. In all other and higher departments of knowledge, such as Newton with gravitation, Young with light, Franklin with atmospheric electricity, Faraday, Henry, Arago, Ampere and Jacobi with dynamical electricity, Agassiz with glacial action; or, to exemplify from our own departments, Linnæus, Jussieu, Cuvier and Geoffroy, all these men are historically eminent for their labors, far more than for attaching their names to the objects of their study. With such examples of high and honest effort, to be imitated by us in proportion to our respective abilities, it is surely an ignoble ambition, and certainly an uncommon one, that would aim at distinction by having the name printed in association with a weed, or a bug, or a bone.

The multitude of new objects is the great curse of Natural History at the present time. When they are nearly all described and named, so

that they may be recognized, a period of more rapid and healthy progress will commence. The attention of the lovers of nature will then be free to observe the habits and to study more minutely the structure of the different species. Classification and economic science will advance together to the perfection which will reward the future students.

One more subject remains to be treated, and I have done. It is one that I approach with hesitation, and even with pain. The recommendations contained in the British American Code, for the future guidance of naturalists in respect to nomenclature, are carefully drawn, and if faithfully and prudently regarded, would leave nothing to be desired.

Unfortunately, under the influence of personal peculiarities, the excitement of political struggles, or the uncongeniality of religious associations, the contributors to scientific literature are sometimes led to forget the laws of good breeding, which are binding upon all civilized men, and should be particularly so upon those addicted to so noble a pursuit as the study of nature.

Under these exaltations of brain, names are sometimes proposed which are offensive* in the highest degree. It is useless to reason with such persons on the impropriety of their conduct, or the irrelevancy of proclaiming opinions which have no place in science, for their minds are occluded against all such appeals to their better nature. What shall be

ON THE INSECTS MORE PARTICULARLY ASSOCIATED WITH SARRACENIA VARIOLARIS *(Spotted Trumpet-Leaf.)**

BY CHAS. V. RILEY, ST. LOUIS, MO.

The insect-catching powers of those curious plants, the Fly-traps (*Dionæa*), the Sun-dews (*Drosera*) and the Trumpet-leaves (*Sarracenia*) have always attracted the attention of the curious, but renewed interest has been awakened in them by virtue of the interesting experiments and observations on their structure, habit and function, that have lately been recorded, and especially by the summing up of these observations in some charming papers by Prof. Asa Gray, which recently appeared in *The Nation* and *The New York Tribune*, under the title of "Insectivorous Plants."

Through the courtesy of Dr. J. H. Mellichamp, of Bluffton, and of H. W. Ravenel, of Aiken, S. C., who have sent me abundant material, I am able to submit the following notes of an entomological bearing, on the Spotted Trumpet-leaf (*Sarracenia variolaris*), which must henceforth rank with the plants of the other genera mentioned as a consummate insect catcher and devourer.

The leaf of Sarracenia is, briefly, a trumpet-shaped tube, with an arched lid, covering, more or less completely, the mouth. The inner surface, from the mouth to about midway down the funnel, is covered with a compact, decurved pubescence, which is perfectly smooth and velvety to the touch, especially as the finger passes downward. From midway it is beset with retrorse bristles, which gradually increase in size till within a short distance of the bottom, where they suddenly cease, and the surface is smooth. There are also similar bristles under the lid. Running up the front of the trumpet is a broad wing with a hardened or ventral side border, parting at the top and extending around the rim. Along this border, as Dr. Mellichamp discovered, but especially for a short distance inside the mouth, and less conspicuously inside the lid, there exude drops of a sweetened, viscid fluid, which, as the leaf matures, is replaced by a white, papery, tasteless, or but slightly sweetened sediment or efflorescence; while at the smooth bottom of the pitcher is secreted a limpid fluid possessing toxic or inebriating qualities.

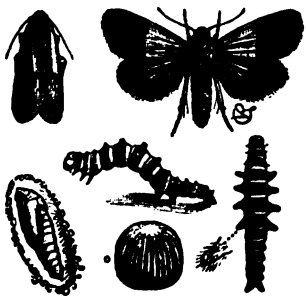
* Read before the American Association for the Advancement of Science, at the late meeting at Hartford.

The insects which meet their death in this fluid are numerous and of all orders. Ants are the principal victims, and the acidulous properties which their decomposing bodies give to the liquid doubtless render it all the more potent as a solvent. Scarcely any other Hymenoptera are found in the rotting mass, and it is an interesting fact that Dr. Mellichamp never found the little nectar-loving bee or other Mellifera about the plants. On one occasion only have I found in the pitcher the recognizable remains of a *Bombus*, and on one occasion only has he found the honey-bee captured. Species belonging to all the other orders are captured, and among the larger species that I have most commonly met with, which, from the toughness of their chitinous integument, resist disorganization and remain recognizable, may be mentioned *Asaphes memnonius* and *Euryomia melancholica* among Coleoptera, *Pentatoma lugens* and *Orsilochus variabilis*, var. *complicatus* among Heteroptera; while katydids, locusts, crickets, cockroaches, flies, moths, and even butterflies, and some Arachidna and Myriapoda, in a more or less irrecognizable condition, frequently help to swell the unsavory mass.

But while these insects are decoyed and macerated in order, as we may naturally infer, to help support the destroyer, there are, nevertheless, two species which are proof against its siren influences and which, in turn, oblige it either directly or indirectly to support them.

The first is *Xanthoptera semicrocea* Guen., a little glossy moth, which may be popularly called the Sarracenia moth. It is strikingly marked with gray-black and straw-yellow, the colors being sharply separated across the shoulders and the middle of the front wings. This little moth walks with perfect impunity over the inner surface of the pitcher, which proves so treacherous to so many other insects. It is frequently found in pairs within the pitchers soon after these open, in the early part of the season or about the end of April. The female lays her eggs singly, near the mouth of the pitcher, and the young larva, from the moment of hatching, spins for itself a carpet of silk, and very soon closes up the mouth by drawing the rims together and covering them with a delicate, gossamer-like web, which effectually debars all small outside intruders. It then frets the leaf

Fig. 25.



XANTHOPTERA SEMICROCEA.—*a*, egg, enlarged, the natural size indicated at side; *b*, *c*, larva, back and side views; *d*, chrysalis; *e*, moth, normal form, with wings expanded; *f*, pale variety, with wings closed.

within, commencing under the hood and feeding downward on the cellular tissue, leaving only the epidermis. As it proceeds, the lower part of the pitcher above the putrescent insect collection becomes packed with ochreous excrementitious droppings, and by the time the worm has attained its full size the pitcher above these droppings generally collapses. This worm, when full grown, is beautifully banded transversely with white and purple or lake red, which Dr. Mellichamp poetically likens in brightness to the Tyrian dye. It is furthermore characterized by rows of tubercles, which are especially prominent on the four larger legless joints. It is a half looper, having but six prolegs, and keeps up, in travelling, a constant, restless, wavering motion of the head and thoracic joints, recalling *paralysis agitans*. The chrysalis is formed in a very slight cocoon, usually just above or within the packed excrement. The species, kindly determined by Mr. A. R. Grote, was many years ago figured by Abbot, who found it feeding on *Sarracenia variolaris*, in Georgia. Guenée's descriptions were made from these figures, for which reason I have made some descriptive notes from the living material.* The species feeds alike on *S. variolaris* and *S. flava*, and there are at least two broods each year, the first brood of larvæ being found during the early part of May, the second toward the end of June, and disappearing with the dying of the leaves.

The second species is a still more invariable living accompaniment of both kinds of Sarracenia mentioned. By the time the whitish efflorescence shows around the mouth of the pitcher, the moist and macerated insect remains at the bottom will be found to almost invariably contain a single whitish, legless grub or "gentle," about as large round as a goosequill, tapering to the retractile head, which is furnished with two curved, black, sharp hooks, truncated and concave at the posterior end of the body.

Fig. 26.

SARCOPHAGA SARRACENIÆ.—*a*, larva; *b*, pupa; *c*, fly, the hair lines showing average natural lengths; *d*, enlarged head and first joint of larva, showing curved hooks, lower lip (*g*), and prothoracic spiracle; *e*, end of body of same, showing stigmata (*f*) and prolegs and vent; *h*, tarsal claws of fly with protecting pads; *i*, antenna of same. All enlarged.

This worm riots in the putrid insect remains, and when fed upon them to repletion, bores through the leaf just above the petiole and burrows

* These will be found in the Transactions of the St. Louis Academy of Science.

into the ground. Here it contracts to the pupa state, and in a few days issues as a large two-winged fly, which I have described (*loc. cit.*) as *Sarcophaga sarraceniæ*—the Sarracenia Flesh-fly.

The immense prolificacy of the flesh-flies, and the fact that the young are hatched in the ovaries of the parent before they are deposited by her on tainted meat and other decomposing or strong-smelling substances, have long been known to entomologists, as has also the rapid development of the species. The viviparous habit among the Muscidæ is far more common than is generally supposed, and I have even known it to occur with the common house-fly, which normally lays eggs. It is also possessed by some Œstridæ, as I have shown in treating of *Œstrus ovis*, the Sheep Bot-fly.[6]

But the propensity of the larvæ for killing one another, and their ability to adapt themselves to different conditions of food supply are not sufficiently appreciated. I have long since known, from extensive rearing of parasitic Tachinidæ, that when, as is often the case, a half dozen or more eggs are fastened to some caterpillar victim only large enough to nourish one to maturity, that they all hatch and commence upon their common prey, but that the weaker eventually succumb to the strongest and oldest one, which finds the juices of his less fortunate brethren as much to his taste as those of the victimized caterpillar. Or, again, that where the food supply is limited in quantity, as it often is, and must be

pitcher does not unfrequently take place, for Dr. Mellichamp writes under date of June 27, as follows: "Most old leaves now examined—I might almost say all—instead of being bored, seem ripped or torn, as if by violence, apparently from without. You see occasionally shreds of the leaf hanging. Surely the legless larva of Sarcophaga cannot do this! What then—toads, or frogs, or crawfish abounding in these moist, pine lands? or rather is not the fat maggot the occasion of the visits of the quail, which lately I have observed here?"

These two insects are the only species of any size that can invade the death-dealing trap with impunity while the leaf is in full vigor, and the only other species which seem at home in the leaf are a minute pale mite belonging apparently to *Holothyrus* in the Gamasidæ, and which may quite commonly be found crawling within the pitcher; and a small Lepidopterous leaf-miner, which I have not succeeded in rearing. There must, however, be a fifth species, which effectually braves the dangers of the bottom of the pit, for the pupa of Sarcophaga is sometimes crowded with a little Chalcid parasite, the parent of which must have sought her victim while it was rioting there as larva.

No other insect, so far as we now know, can crawl up the slippery belt, but tumble into the tube and there meet their death.

Certain questions very naturally present themselves here: First, What gives the flesh-fly more secure foothold on the slippery pubescence than the common house-fly exhibits? Second, What enables the larva of the flesh-fly to withstand the solvent property of the fluid which destroys so many other insects? Third, What gives the Sarracenia moth and its larva similar security? I can only offer, in answer, the following suggestions: The last joint of the tarsus of the common house-fly has two movable, sharp-pointed claws, and a pair of pads or "pulvilli." These pads were formerly supposed to operate as suckers, and all sorts of sensational accounts of this wonderful sucker have been given by popular writers, who forgot that there are any number of minute insects having no such tarsal apparatus, which are equally indifferent to the laws of gravitation so far as walking on smooth, upright surfaces, or on the ceiling, is concerned. In reality, these pads are thickly beset on the lower surface with short hairs, most of which terminate in a minute expansion kept continually moist by an exuding fluid—a sort of perspiration. Take the soft human hand, moistened by perspiration or other means, and draw it, with slight pressure, first over a piece of glass or other highly-polished surface, and then over something that has a rougher surface, such as a

planed board, a papered wall, or a velvety fabric, and you will experience much greater adhesion to the smoother objects, and may understand the important part which these moist pads play in the locomotion of the fly. They also act, in part, like the cushions of a cat's paw in protecting and preventing abrasion of the claws, which are very useful on the rougher surfaces, where the pads are less serviceable.

Now, compared with *Musca domestica*, the claws of *Sarcophaga sarraceniæ* are much the longest and strongest, and the pads much the largest, presenting three or four times the surface. These differences are, I think, sufficient to explain the fact that while the common fly walks with slippery and unsteady gait on the smooth pubescence (the retrorse nature of this pubescence sufficiently explaining the downward tendency of the movement), its sarcophagus congener manages to get a more secure footing; for not only does the latter present a larger adhesive surface, but the longer claws are more likely to reach beyond the pubescence and the bristles, and fasten to the cellular tissue of the leaf beyond. Moreover, Sarcophaga is more thickly beset with stiff, spinous bristles than Musca, and Dr. Mellichamp says that when disturbed it buzzes violently about, just as if an animated sheep-bur had fallen into the tube—not apt to go down, because it will hitch and stick, and finally, by main force, it generally emerges, but once in a while also succumbs.

In answer to the second question I can only say that there is nothing exceptional in the power of the larva to withstand the solvent quality of the fluid; it is, on the contrary, in accordance with the facts known of many species of Muscidæ and Œstridæ, some of which, like the well-known horse bot, revel in a bath of chyme, while others are at ease in the intestinal heat of other warm-blooded animals. It is also well known that they will often live for hours in strong liquids, such as alcohol and turpentine.

In answer to the third question, the moth is doubtless assisted in walking within the tube by the spines and spurs on the legs, which it, in common with most other moths, possesses—the tarsi in Xanthoptera being armed with spines, and the spurs being quite long, and in *semicrocea* usually shod at tip with a corneous point. Its larva overcomes the treacherous surface by either carpeting it with silk or destroying it.

CONCLUSION.

To one accustomed to seek the why and wherefore of things, the inquiry very naturally arises as to whether Xanthoptera and Sarcophaga

play any necessary or important role in the economy of Sarracenia. Speaking of the Sarcophaga larva, Mr. Ravenel asks, "May he not do some service to Sarracenia as Pronuba does to Yucca?" And if so, may not all this structure for the destruction of insects be primarily for his benefit? Can he be merely an intruder, sharing the store of provision which the plant, by ingenious contrivance, has secured for itself, or is he a welcome inmate and profitable tenant? Self-fertilization does not take place in Sarracenia, and the possibility that the bristly flesh-fly aids in the important act of pollination, lends interest to the facts. No one has witnessed with greater pleasure than myself the impulse which Darwin has of late years given to such inquiries; but we should be cautious lest the speculative spirit impair our judgments or ability to read the simple lesson of the facts. My own conclusions summed up are:

First: There is no reason to doubt, but every reason to believe, since the observations of Dr. Mellichamp, that Sarracenia is a truly insectivorous plant, and that by its secretions and structure it is eminently fitted to capture its prey.

Second: That those insects most easily digested (if I may use the term), and most useful to the plant, are principally ants and small flies, which are lured to their graves by the honeyed path, and that most of the larger insects, which are not attracted by sweets, get in by accident and fall victims to the peculiar mechanical structure of the leaf.

Third: That the only benefit to the plant is from the liquid manure resulting from the putrescent captured insects.

[Mr. Ravenel, in making a transverse section near the base of the young leaf, noticed large tubular cells passing down through the petiole into the root, and much of the liquid manure may possibly pass through these into the root stalk.]

Fourth: That Sarcophaga is a mere intruder, the larva sponging on and sharing the food obtained by the plant, and the fly attracted thither by the strong odor, as it is to all putrescent animal matter or to other plants, like *Stapelia variegata*, which give forth a similar odor. There is nothing to prove that it has anything to do with pollination, and the only insect that Dr. Mellichamp has observed about the flowers with any frequency, is a Cetonid beetle—the *Euryomia melancholica*, which, with other species of its genus, is commonly found on many different flowers.

Fifth: That Xanthoptera has no other connection with the plant than that of a destroyer, though its greatest injury is done after the leaf has

performed its most important functions. Almost every plant has its peculiar insect enemy, and Sarracenia, with all its dangers to insect life generally, is no exception to the rule.

Sixth: That neither the moth nor the fly have any structure peculiar to them that enables them to brave the dangers of the plant, beyond what many other allied species possess.

PRELIMINARY CATALOGUE OF THE NOCTUIDÆ OF CALIFORNIA.

Part II.

BY AUG. R. GROTE,

Curator of Articulata, Buffalo Soc. of Natural Sciences.

10. Agrotis Cochranii Riley. (See ante p. 155).

The specimens are hardly to be distinguished from Eastern material; they are perhaps a little larger, and of a little different tone of color. My determination of this species as *lycarum* H.-S., based on a figure, is probably incorrect. It seems possible that Harris has described *A. Cochranii* under the name *messoria*, which should then be retained. More material of *A. fuscigerus* (ante No. 15) shows that this is a good but variable species, both in size and color. There is always a uniformity in the disposition of the ground tint over the primaries above, and usually the broad inner lunulations of the t. p. line and the median shade are characteristic. Some specimens have the hind wings of a pale yellowish testaceous, with double subterminal shade lines visible.

19. Dianthoecia niveiguttata (Grote). (Ante p. 156.)

In my ♀ specimen the ovipositor is apparently broken off.

28. Agrotis alternata Grote.

Mendocino, Mr. Behrens, June. Nos. 4 and 164. The California specimens vary in distinctness of the markings on the forewings as well as in the general color. One has the primaries entirely plain and unicolorus. I do not think there are grounds for suspecting a different species.

29. *Agrotis innotabilis* Grote, Proc. Ac. N. Sci., Phil., 1874.

Sauzalito, Mr. Behrens, August.

30. *Dianthoecia pensilis* Grote, Proc. Ac. N. Sci., Phil., 1874.

Sauzalito, Mr. Behrens, Aug., Sept. 11th, Nov., both sexes. Nos. 181 and 183, 123, 147. The specimens are less brightly gray than those from Victoria. The male has the primaries more uniformly broken up with reddish. The white shade above internal angle is indicated by the pallor of an angulation of the subterminal line.

31. *Hadena arctica* (Boisd.), Bull. B. S. N. S., 1, p. 42.

Sierra Nevada, Hy. Edwards, Esq., No. 3513.

32. *Hadena Bridghami* (G. & R.) l. c. p. 142.

Sierra Nevada, Hy. Edwards, Esq., No. 3510.

33. *Hadena devastator* (Brace.)

California, Hy. Edwards, Esq. Mr. Behrens, No. 193.

34. *Hadena lateritia* (Hubn.) This is *H. dubitans* Walk., of my 'List.

Sierra Nevada, Hy. Edwards, Esq., No. 3512.

35. *Hadena genialis* Grote, List N. Am. Noct., p. 66.

California, Mr. Behrens, Nos. 7 and 64.

36. *Hadena castanea* Grote, Bull. B. S. N. S., 2, p. 156.

California, Mr. Behrens, No. 10 (red label).

37. *Hadena albina* Grote, l. c. p. 157.

California, Mr. Behrens ; Sauzalito, May 15th, No. 78.

38. *Hadena curvata* Grote, l. c. p. 157.

California, Mr. Behrens, Nos. 70 and 99.

39. *Hadena divesta* Grote.

A moderate, slender bodied species, resembling somewhat in its colors *Dianthoecia pensilis*. Eyes naked ; abdomen strongly tufted dorsally. Fore wings dark gray, with the basal field shaded with carneous ochrey ; a patch above the submedian dash and extending between the spots, and the subterminal line shaded with the same color. There is a narrow black basal ray. Ordinary spots large and wide, concolorus, the blackish median shade marked on costal region between them. Median space wide, owing

to the outward removal of the t. p. line; the latter somewhat as in *H. curvata*, but much more removed beyond the reniform. T. p. line angulated opposite the cell, geminate, even in its course, its inner line forming a regular series of slight lunulations; the filling in of the line becomes white inferiorly. Subterminal line preceded medially by cuneiform black marks. Hind wings fuscous, darker outwardly, with a transverse shade line without the middle. Beneath fuscous, with even common line and discal spots.

Expanse 32 m. m. Sauzalito, Aug. 12th, Mr. James Behrens, No. 145.

40. Hadena marina Grote, List N. Am. Noct., p. 67.

California, Mr. Behrens, No. 68.

41. Hadena flava Grote, Trans. Am. Ent. Soc., 5.

Victoria, Mr. Crotch; Colorado, Mr. Mead.

42. Morrisonia peracuta Morr., Bull. B. S. N. S., 2, p. 114.

California?

43. Eupsephopaectes procinctus Grote, Bull. B. S. N. S., 1, p. 138, pl. 4, fig. 6.

California, Hy. Edwards, Esq., No. 73; Mr. Behrens.

44. Hydroccia nictitans var. *erythrostigma* (Haw.)

California, Mr. Behrens, July 30th, No. 165.

45. Ochria sauzalitæ Grote.

Sauzalito, September 17th, Mr. Behrens, No. 161; Hy. Edwards, Esq. No. 135.

This species has a distinct clypeal tubercle, and is therefore congeneric with the European *flavago*. It belongs to *Gortyna* of Lederer, but not of Hubner, whose genus is equivalent to *Hydræcia* "B" of Lederer. For the European *flavago*, I have shown that *Ochria* Hubn. must be retained. I have separated *Hydræcia* "A." of Lederer under Guenée's name, but I am of opinion that for this genus, of which the type is *nictitans*, the term *Apamea* must be retained. It is not a little singular that the species which most nearly resembles *flavago* in America, viz., *cataphracta* Grote, should have no clypeal tubercle, and therefore must be referred to a different genus. In my "List" I have erroneously referred *Gortyna purpurifascia*, an Eastern species without the tubercle, to *Ochria*, which, so far should only contain *O. sauzalitæ*. The Cal. species differs,

from *G, purpurifascia* by the t. p. line being slightly arcuate superiorly. In size and ornamentation the Californian species rather resembles *rutila*, which wants the tubercle.

46. Admetovis oxymorus Grote, Bul. B. S. N. S., 1, p. 133, pl. 4, fig. 5.
Sierra Nevada, Hy. Edwards, Esq., No. 2733.

47. Heliophila pallens [Linn].
California, Mr. Behrens, No. 10 [red label].

48. Heliophila phragmitidicola [Guenee].
Sauzalito, Sept. 25th, Mr. Behrens, No. 169.

49. Ufeus plicatus Grote, Proc. Bost. Soc. N. H., 16, p. 241.
California, No. 4414, Hy. Edwards, Esq.

50. Zosteropoda hirtipes Grote, List N. Am. Noct., p. 68.
California, Hy. Edwards, Esq., No. 3484.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

(Continued from page 198.)

ASPIDISCA.

A. diospyriella. N. sp.

This species was bred from minute mines in the leaves of Persimmon trees *(Diospyros virginiana)*, gathered in great abundance at the "Bee Spring" camp of the Kentucky Geological Survey, in Edmondson County, a few miles west of the Mammoth Cave. I have never met with it in Northern Kentucky, where the Persimmon tree also grows, but is comparatively rare.

Head and thorax, and a little more than the basal half of the primaries pale leaden gray, with a metallic, almost silvery lustre; antennae fuscous above, silvery fuscous below; just behind the middle of the wing are two

silvery streaks, one on the costal and one on the dorsal margin, the latter a very little before the former, and both strongly dark margined before and behind, their anterior dark margins meeting just behind the middle of the wing, where they are somewhat posteriorly angulated. The silvery streaks are not confluent, being separated by the anterior point of a dark brown dorsal patch, placed behind the dorsal streak. This dark brown dorsal patch is common to all species of the genus now known, and in all of them it forms the posterior margin of dorsal silvery streak, and becomes confluent with the posterior dark margin of the costal streak also; the anterior dark margins of both silvery streaks are margined faintly before with pale golden, much less distinct and covering much less space than in *splendoriferella*; behind the posterior dark margin of the costal streak is a small golden patch, as in *splendoriferella*, containing a small black dorsal streak (or, perhaps more correctly, margined by it.) In perfect fresh specimens of *splendoriferella* the extreme costa in this golden spot is always more or less streaked longitudinally with dark brown scales; these dark brown streaks are absent in this species, and besides, in *splendoriferella* the anterior dark margins of the costal and dorsal silvery streaks are not confluent and posteriorly angulated as in this species, but are separated by a narrow golden line, which is carried backwards between the silvery streaks themselves, thus connecting the golden patch before the streaks with the costal golden spot behind the streaks; in this species they are not so connected. Mr. Stainton, in a note on *splendoriferella*, in his edition of the Clemens papers, states that the silvery costal and dorsal streaks are confluent in that species. I have never found them so, but always under a good lens I find them separated by the narrow golden line as above stated. In *splendoriferella* the dark brown dorsal spot is separated from the fan-shaped apical spot by a narrow projection of the costal golden spot, which extends to a small spot of silvery scales on the dorsal edge of the apical spot; but in this species this golden projection is only represented by a small golden spot, which is separated from the costal golden one by a narrow blackish line, which extends from the brown dorsal spot to a small silvery spot at the beginning of the fan-shaped apical spot. As in all the other species, there is also a small silvery spot on the costal side of the fan-shaped apical brown patch, as well as one on the dorsal side, and the one at its beginning. The fan-shaped apical brown patch is traversed across its middle (between the two silvery spots) by a streak of paler brown, thus dividing it into two velvety black (rather than brown) spots. As in *splendoriferella*, there is a narrow brown

line from the apex of the wing to the apex of the ciliae, and as in that species, the ciliae are yellowish rather than yellowish brown, as Dr. Clemens describes them. Dr. Clemens' statement that in *splendoriferella* there is a black apical spot, with metallic scales, in its centre, also seems to me misleading; there is only the fan-shaped apical black spot divided across its centre by a paler brown streak, at each end of which is a minute speck of silvery scales, and there is the third one at the beginning or handle of the fan-shaped spot—and this is true of all the species. I have not been able to detect separate from the brown dorsal patch what Dr. Clemens calls "a blackish brown hinder marginal line in the ciliae" in *splendoriferella*, unless by it is meant the brown band which crosses the fan-shaped spot; but by careful observation with a lens, two such lines may be found in the dorsal brown patch, darker than the surrounding portions, but which I have not been able to detect in *diospyriella*. The basal portion of the wing is more silvery than in *splendoriferella*, and the apical portion is much less golden, so that in this species the dark brown and silvery hues prevail over the golden, while Dr. Clemens was perhaps right in calling golden the ground color of the apical part of the wing in *splendoriferella*.

In *juglandiella* the apical part of the wing is more golden than in *diospyriella*, but less so than in *splendoriferella*. It has, like *diospyriella*, the anterior dark margins of the two silvery streaks confluent, and the silvery streaks are separated in *juglandiella* as just described in *diospyriella* But, as in *splendoriferella*, the golden costal patch sends off towards the dorsal ciliae and *to* the little silver spot which on that side margins the fan-shaped spot, a short streak which is not cut off from the rest of the golden patch by a process from the costal brown spot to the fan-shaped spot, as we have seen is the case with *diospyriella*. The case of *juglandiella*, like that of *diospyriella*, is nearly oval, whilst that of *splendoriferella* is rather trapezoidal. But *juglandiella* is but little smaller than *splendoriferella*, whilst *diospyriella* is but little larger than *salicifoliella* Some of the points of difference that I have mentioned are only brought out by the use of the compound microscope.

Considering the near relationship of the food plants (Walnut and Hickory), it is strange that I have not sooner thought that *juglandiella* may be *lucifluella* Clem. It may be, though I have not been able to recognize it in Dr. Clemens' description. Indeed, it seems to me that *lucifluella* and *A. ella* are nearer to each other, though I have not been able to recognize *A. ella* in Dr. Clemens' description of *lucifluella*. I

am, however, satisfied that *A. ella* must either be *lucifluella* or the unknown species which mines *Ostrya* leaves. I have bred *ella* frequently from cases found adhering to various trees, but I have not been able to breed either the Hickory species (*lucifluella*) or the unknown *Ostrya* species. *A. ella* must be one of these, because the thoroughness of my search satisfies me that there are no other mines of this genus to be found in this region, except those of *splendoriferella* and *saliciella*, which are sufficiently distinct, and both of which I have bred. If *juglandiella* is *lucifluella*, then *ella* must be the *Ostrya* miner. *Splendoriferella* is decidedly the largest species that I have seen, but Dr. Clemens states that *lucifluella* is a little larger than it. This, however, is probably a mistake, as the cases that I have seen of *lucifluella* are even smaller than those of *splendoriferella*, and very greatly resemble those of *A. ella*, while also the vegetable hairs on the cases of *A. ella* appear to be identical with those on Hickory leaves.

The minute size of *diospyriella* is one of the strongest reasons for considering it a distinct species. *Al. ex.* $\frac{5}{32}$ inch.

MISCELLANEOUS.

DRYOCAMPA RUBICUNDA.—About four or five years ago I found a dead male specimen of this rare moth under an apple tree in our garden, and although a good deal rubbed, it was perfectly recognizable. This is, I am informed, the only instance of this moth having been taken in this city.—H. H. LYMAN, Montreal, P. Q.

DR. A. S. PACKARD, of Salem, Mass., is about to publish his long projected monograph of Geometrid moths, and designs giving a figure of each species. To make the work as complete as possible, specimens of this family are earnestly desired for study, and will be carefully returned, or other specimens sent in exchange.

DEATH OF FRANCIS WALKER.—We have just received the sad intelligence of the death of this distinguished Entomologist, who died at his residence, Elm Hall, Wanstead, on the 5th of October. A more extended notice of him will appear in our next.

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THE LARVÆ OF DEPRESSARIA DUBITELLA AND GELECHIA RUBENSELLA.

BY MARY E. MURTFELDT, KIRKWOOD, MO.

Being much interested in the Tineidæ, Mr. Chambers' articles on this family of moths are the first to receive attention as the successive numbers of your magazine come to hand.

I have had the satisfaction of rearing from their larvæ many of the winged gems described in your pages, among others the two species named above. Now, as Mr. C. seems to have been in some doubt as to his own determination of these species, of which he has as yet—as he informs me—seen only the imagines, it occurs to me that a description of their larval characteristics might afford some aid in deciding the doubtful points.

The larva of *Depressaria (Gelechia) dubitella* Cham. is very characteristic and beautiful. It may be found during the months of July and August on *Ambrosia artemisiæfolia*, concealed in a fusiform case, which it constructs by drawing together the pinnatifid divisions of the leaf. I think it forms but a single case, which at first consists of but two divisions of the leaf drawn together with silken threads. As it increases in size, its domicile is enlarged by the incorporation of other lobes of the leaf. It is always to be found in its case in the daytime, and probably emerges only at night to feed.

This larva is rather more than half an inch in length, elongate and slightly flattened. Head horizontal, semi-elliptical, highly polished jet black. First segment horny, black and polished like the head. Second segment, anterior half *velvety* black, posterior half ivory white, ornamented above with five linear black marks, extending longitudinally backward; the dorsal and sub-dorsal ones do not reach to the posterior edge of the segment, while the lateral lines, above the stigmata, do. The remaining segments are of a translucent white color, varying from pearly to yellowish. They are marked with three faint, longitudinal, brown lines and with a few

minute, black, piliferous spots, each of which gives rise to a single, short, fine hair. Venter of the thoracic segments and thoracic legs black; prolegs and under surface of abdominal segments whitish. The change to pupa usually takes place within the larval case. Chrysalis slender, smooth, bright reddish brown, except the head and wing sheaths, which are much darker. Mr. Riley once brought me a leaf-folding larva on Hackberry, which resembled these Ambrosia case-makers in every respect, but as I did not succeed in obtaining the imago from it, I am unable to say whether or not the insects were identical.

In *my* specimens of *dubitella* the purple-brown of the anterior wings is marked with *four* ochreous spots, instead of *three*, as in Mr. Chambers' description, and the hind wings are more nearly gray than fuscous.

There is another leaf-folding larva of the same size and habit of *D. dubitella*, which also feeds on *Ambrosia artemisiæfolia*, and which is even more elegantly marked in black and white than the latter. This insect, which I take to be a true but undescribed Gelechia, I may, perhaps, describe in a future paper. I would respectfully propose for it the name of *Chambersella*.

The larva of *G. rubensella* is an external feeder on Oak. It inhabits a thin web at the base or near the tip of the leaf, and skeletonizes the upper surface of the latter. Its length is rather more than 3/8 of an inch. In form it is elongate and sub-cylindrical, tapering anteriorly and posteriorly from the middle, and has the sutures deep. The color is grass green, striped with numerous very fine longitudinal lines of purple, and ornamented with two sub-dorsal rows of conspicuous purple spots, situated at the sutures. Head horizontal, pale brown, pointed toward the jaws with two irregular whitish dashes on each side. Legs and prolegs pale green—the latter very narrow. This pretty larva is as characteristic in its habits as in its appearance. It does not touch the leaf except when feeding, but remains suspended in a sort of gallery of delicate web-work, through which it moves with surprising rapidity. It changes to pupa within a frail cocoon, on the surface of the ground. The chrysalis is pale brown, slender and chiefly characterized by long, free wing sheaths. The moth issues in about ten days. In its perfect state this insect bears so close a resemblance to *G. roseosuffusella* Clem., that it is difficult to distinguish it from the latter. It is, however, as a rule, smaller, darker and more roseate, while the larva is entirely different, that of *G. roseosuffusella* mining the leaves of Clover, and being much less strikingly marked.

ON ENTOMOLOGICAL NOMENCLATURE.

BY JOHN L. LECONTE, M. D., PHILADELPHIA.

Part II.—On Generic Types.

"Ignorato genere proprio, nulla descriptio, quamvis accurate tradita certum demonstret; sed plerumque fallat."—CÆSALP. apud Linn., Syst. Nat., xii, 1, 13.

In the first part of this essay I endeavored to show the confusion which resulted from the application of the law of priority to the names employed in the early development of our science by persons who had no idea corresponding to the law which has since been formulated. We will now attempt to discuss the second great fallacy in the exegesis of the writings of the founders of the science; the selection on principles, more or less arbitrary, but always opinionative, of generic types, when these *have not been explicitly* mentioned by the author.

With the more minute observation of differences in structure, and the consequent multiplication of genera, has arisen an idea that all classification, generic and otherwise, is simply a human contrivance for the purpose of expressing degrees of resemblance between the organic forms which we collect and recognize as distinct.

In short, that our best efforts to ascertain the relations of organic beings has resulted, not in a system, but in a dictionary.

This was not the idea of the fathers in science—nor is it the idea of many respectable students of the present day.

The language of Linnæus is clear upon this subject. 'Genus et species naturæ opus;' to him and to his followers there was no generic type. Each species comprised in the genus was equally typical, unless, as in rare cases, it was mentioned as aberrant, with a suspicion expressed in some instances that it would be subsequently separated as a distinct genus. When dissections were made, as in the fuller definitions in the foot notes in the works of Fabricius, it was not because the dissected species were selected peculiarly as the type of the genus (for in many instances the dissections are not part of the generic formula), but merely that the most common and available species was chosen for the purpose of giving more information than was conveyed by the condensed generic diagnosis.

In the gradual progress of science, and with the multiplication of genera, it came to be considered that the person who recognized the necessity of subdividing an ancient genus, should exercise his judgment regarding the part to which the old name should adhere; and in most instances this was attended with no inconvenience.

Rarely, as in the case of TEMNOCHILA *Wm.*, the name of the original genus TROGOSSITA was retained for a group which did not accord with the original definition; the new name was imposed upon the set of species which should have kept the original name. These instances are but few in number, and the exposure of the error committed is sufficient to cause its immediate correction.

I would therefore infer that the practice of some students in recent times, of applying the older generic names in a different sense from that in which they were restricted by the persons first making the divisions, is founded upon an incorrect interpretation of what was formerly meant by a genus; and that these old authors, were they now alive, would strongly resist the limitation of their generic idea to a single type-species.

When the describer of a genus establishes the genus upon a single species, either because it is the only one known to him, or because, as is sometimes the case, he does not choose to enumerate the others, then of course, from the accident of the case, that particular species becomes typical of the genus, and must remain so as long as the present system of nomenclature is adopted. But when, on the other hand, several species are included in the genus, and they all agree accurately in the possession of the *characters mentioned* as defining the genus, they must in my opinion be regarded as *equally typical.* It would save much confusion in interpreting the modern use made of these restricted older names, if in all instances in systematic works the restricting authority was added in parenthesis.

A more difficult source of confusion is that resulting from the erroneous position ascribed to a genus, which renders it, with the ordinary usages of interpretation, absolutely irrecognizable; as when, for instance, the Byrrhide genus AMPHYCYRTA was described by Mannerheim as a Tenebrionide, under the name Eucyphus, and the genus AMPHIZOA also as a Tenebrionide (Dysmathes). In these two cases Mannerheim's names fail from want of priority, but had this not been the case, I still maintain that the names of erroneous position should be suppressed in favor of later names which may have been independently given, and correctly

defined. The genus being erroneously described, of course fails to represent any idea realized in nature, and the specific name must therefore fall with it, and the whole name be quoted in synonymy, with the error mark (‡) appended.

While I fully recognize the importance of having the same object always spoken of by the same name, I must frankly say that the forced uniformity aimed at by somewhat arbitrary processes, in a few familiar instances, seems to be capable of producing still greater confusion. To take an example: our common tumble-bug is equally known to most students of entomology as CANTHON or COPROBIUS, and specifically as *lævis* or *volvens*, the first generic and specific names having priority. Recently, however, on the authority of Gemminger and Harold, and of Mr. Crotch, the specific name *hudsonias* has been resurrected from Forster's Centuria Insectorum. The priority of this last name is not borne out by any evidence in the books containing the descriptions, and if it be valid, can only be demonstrated by careful bibliographical investigation of a collateral kind. It is unreasonable to expect that our familiar names for common objects, for it is only among them that such changes are likely to be suggested, should thus be altered where there can be any excuse for resisting the innovation. But I will go farther and say, that where two names have become from peculiar circumstances equally known, there can be no serious objection to the writer using that one for which he has preference. If I had occasion to write concerning the great Aristotle, it is certain that all those persons capable of understanding what I would desire to say about him, whether I mentioned him by his name or spoke of him as the Stagyrite, or even as the Preceptor of Alexander, would know who was meant.

When the different names which have been applied to the most common species, have been recognized by competent authorities as synonyms, and have been thus collated in accessible registers, catalogues or systematic works, it is not a subject worth contention which of these equally known names may be used by individual writers. Certainly it is wrong for a person, without a careful study of bibliography, to change his habit in the use of a name, because the latest authority advocates a subversion. It is by no means true in natural history that the latest is the best, and those who are not critical students in these subjects will do well to follow the advice given in the first part of this essay, to *resist innovation*,* until they find

* Confusis enim nominibus omnia confundi necesse est.—CESALP. apud Linn., Syst. Nat. xii, i, 13..

that the later views are adopted by those to whom they have a right to look for instruction upon these technical points. Let them, at any rate, be clear in their minds that the changes are in accordance with the existing laws, or let them agitate for such alteration in the current code as will produce legally the modifications they desire.

Other special cases may arise of still greater difficulty than those I have here discussed. For the proper solution of these, I think the suggestion of Mr. Alfred Wallace* is most valuable. It is that all disputed points in nomenclature should be referred for investigation and decision to a committee of experts. Such a committee could be readily formed in the Entomological Club of the American Association for the Advancement of Science, which would dispassionately determine all questions relating to the progress of the science in North America, and announce their decisions each year. These decisions would, I am convinced, be cheerfully adopted by most, if not all of those who are occupied in the study of the insects of this continent.

One more suggestion in conclusion. It is this: That in proportion as the objects become well known, and especially in those species which fortunately possess no synonymy, all reference to authorities should be dropped, except when *bibliographical reference* to a full description or figure is necessary. If, however, a synonym must be mentioned, let the author of this supplementary name be quoted.

Should this suggestion be adopted, it will result that the name of the describer will not be unnecessarily connected with the valid name of the species, and one strong support of the small personal vanity which I have criticized in the first part of this essay will be destroyed. Another important result will be that the maker of a synonym will know that his name will be inseparably connected with that synonym, whenever it is mentioned; and that, therefore, so far from being an honor, or a recognition of good work, the use of an authority will come to be known as an indication of bad or imperfect work, and the makers of species on hasty study or on defective materials will be discountenanced.

* Address of the President, Trans. Ent. Soc. London, 1871, lxviii.

ON SOME OF OUR COMMON INSECTS.

No. 15. THE IO MOTH—Saturnia (Hyperchiria) Io, Fabr.

BY E. B. REED, LONDON, ONT.

This lovely moth is well worthy a place in the cabinet of the collector, and is always sure to attract notice and admiration. The larva, of which fig. 27 represents a full-grown specimen, is of a most delicate apple or pea green colour, with a broad, dusky white stripe at each side, bordered with lilac on the lower edge. The body is covered with clusters of green bristles, tipped with black. These bristles are exceedingly sharp, and when the insect is handled, will produce a very irritating sting, similar to, but much sharper than that of the nettle, and the effect of which causes a reddening of the flesh and the immediate appearance of raised white blotches, which last for a considerable time.

Fig. 27.

Fig. 28 shows the appearance of these bristles, some of them, as *b*, being stouter and more acute than the others, and able to inflict a sharper and more penetrating sting. According to Mr. Riley, the irritating property belongs to the substance of which the spines are formed, and his opinion was strengthened by the fact that the spines of a cast off skin, which had been in his cabinet for years, still retained the irritating power.

Fig. 28.

In the earlier stages the caterpillars are gregarious, feeding together side by side, and in going to and returning from their place of shelter, moving in regular files, like the processionary caterpillars of Europe (*Lasiocampa processionea*). When about half grown they

disperse, each seeking a location for itself. They moult five times, devouring their cast off spinous skins. After being in the larval state about eight weeks, they arrive at maturity, and are then about two inches and a half long.

Their food plants are numerous. They have been found on Black Locust, Indian Corn, Willows, Sassafras, Wild Cherry, Elm, Hop-vine, Balsam, Balm of Gilead, Dogwood, Choke Cherry, Currant, Cotton and Clover. I, myself, this year found it on the English Filbert, and raised it to maturity on that plant. I have, however, more commonly found it on the Choke Cherry. The larva, when full grown, crawls to the ground, where, amid the loose leaves and rubbish, it forms a rough covering, within which it makes a slight cocoon of tough, gummy, brown silk. In this retreat a change is soon effected to the pupal or chrysalis state, and having remained therein during the winter and spring months, the moth emerges in the perfect winged state about June. The moths are especially remarkable for the difference between the sexes, both in size and colour.

The male, fig. 29, which is much the smallest, is of a deep Indian or maize yellow; on the fore wings are two oblique, wavy lines, near the hind margin, and a zigzag line near the base. There is also a large, dark, reddish, central reniform spot or blotch. The hind wings are broadly shaded with purple, next to the body; on the hinder margin is a purplish curved band, and within this again is a smaller one of a dark purple or violet colour. In the centre of this last band and the middle of the wing is a large, round, blue spot, with a whitish centre and a broad border almost black; the under side of the wings is of the same deep yellow; the fore wings showing the same dark occellated spot, as on the other side, and having the inner margin broadly shaded with purple. The hinder wings are more uniform in color, with a transverse purple line and a very small, distinct white spot representing the centre of the large spot on the upper side.

Fig. 29.

The body is also deep yellow.

The female, fig. 30, is considerably larger; the specimens vary very much in color, from a dark purplish brown to a warm ochreous red. The fore wings have similar wavy, zigzag lines; the reniform blotch being less distinct than in the male; the inner margin is of a deeper colour, and is

Fig. 30.

thickly coated with short hair, like the head and thorax. The hind wings are similar to those of the male; the under side has the same uniform colour, and the markings and spots as in the male.

The body is the same shade as the wings, the abdomen being a little lighter in colour, and each segment being bordered with a narrow reddish band.

The moths vary in size from two and a half inches in the male to three and a half in the female.

The eggs are deposited on the under side of the leaf, and are described by Mr. Riley as being compressed on both sides and flattened at the apex, the attached end smallest, in colour cream white, with a small black spot on the apical end and a larger orange one on the sides.

TINEINA FROM TEXAS.

BY V. T. CHAMBERS, COVINGTON, KENTUCKY.

A collection of Tineina received from Mr. Belfrage, of Waco, Texas, presents some points worthy of mention apart from the descriptions of the new species.

The collection consists of about two hundred and fifty specimens in tolerably good condition, referable to seventy-six species and twenty-seven genera. Such a number of genera and species is evidently typical of the

Tineina of the locality where they were collected. Twenty-nine of these species belong to the genus *Gelechia*, and twenty-five others belong in the same family. Fifty-three of these species thus belong to the *Gelechidæ*, and only twenty three to other genera. The *Gelechidæ* are numerous everywhere, and a preponderance of species belonging to this family is to be expected in almost any collection, but I have not known any other collection in which it was so great as in this one.

The collection contains seven species of *Laverna*, and another species which I have made the type of a new genus very nearly allied to *Laverna*. These seven species differ from each other somewhat as to the neuration, and also as to the raised tufts on the wings, but perhaps not to any greater degree than do well recognized species of *Laverna*, as e. g. *L. Stainteni* and *L. langiella* of Europe. Mr. Stainton *(Nat. Hist. Tin., vii)* enumerates only twenty species belonging to this genus, and three others are also known from this country. This collection then contains nearly one-third as many species of this genus as were heretofore known altogether. Of the species heretofore known, but one (if I rightly understand Mr. Stainton) is fairly described as white, that being the prevailing or ground color, though some others have more or less white markings. But of these seven, five may fairly be placed in the white section; and the other two are also strongly marked with white.

The collection contains five species which I have placed in *Butalis*, though with great doubt as to two of them, which are totally unlike all other species of the genus in color, though I have not been able to discover any structural differences whatever.

But it is, perhaps, more remarkable for what it does not than for what it does contain. As before stated, such a collection is typical of the Tineina of the locality where it was collected. Yet it contains no specimen of *Lithocolletis*, which, both in the collections of Dr. Clemens and myself, is the genus next most numerous in species and individuals after *Gelechia*. *Tinea*, *Coleophora*, *Gracilaria*, *Bucculatrix*, *Tischeria* and *Nepticula* are also genera usually numerous in species and individuals. Yet this collection contains only one *Tinea*, two *Coleophora*, no *Gracilaria* (unless a single species of *Coriscium* be held to represent it), and three? species of *Bucculatrix*, one of which is a somewhat aberrant form.

All of the species are new except ten. These are as follows:

Gelechia cercerisella Cham.,
" *æquæpulvella* "
Ypsolophus eupatoriella Cham.,
Plutella cruciferarum Zell.,

Gelechia disco-ocdella Cham. *Holocera glandulella* Riley,
" *roseo-suffusella* Clem., *Bucculatrix pomifoliella* Clem.,
Hagno faginella Cham., *Hamadryas Basettella* "

Of these ten species, *G. roseo-suffusella*, judging from the number of specimens in the collection, appears to be by far the more numerous, though it may turn out that some of the specimens do not belong to this species, but to a very closely allied and undescribed one; and all the specimens are of a darker hue than those from the Northern States. This species appears to be distributed nearly all over the United States, and is perhaps the most common species of the genus.

G. cercerisella was originally placed by me in *Depressaria*, and I was led to do this by giving too much importance to the neuration of the wings. It is, however, properly referable to *Gelechia*. The specimens—thirteen in number—belong to a very well marked variety. In all the specimens (a great many) that I have heretofore examined, the fore wings are marked just within the middle of the dorsal margin by some faint, short, ochreous streaks, only discernible distinctly under a lens. In these thirteen specimens these ochreous streaks are not present, and their place is occupied by a larger snow white spot, like those on the margins of the wings.

G. æquæpulvella is well represented in the collection, but there appears to be some variation in the shade of the ground color and in the density of the dusting.

The single specimen of *Holocera glandulella* differs from Mr. Riley's description as follows: there is a single discal spot behind the angulated line, and two others at the end of the cell, instead of "two discal spots," as stated by Mr. Riley; besides, "three tolerably distinct, dusky marks around the discal spots" are wanting. Unfortunately I have now no typical specimens of this species, with which to compare it, but I doubt not it is the same.

Hamadryas Bassettella was described by Dr. Clemens from specimens sent to him from Connecticut. He states that it appears to be congeneric with a portion of *Gelechia*. The remark is applicable to almost every species of the family *Gelechidæ*. Dr. C. does not seem to have observed its very close relationship to *Dasycera*, nor, perhaps, its still closer relationship to, or even identity with the genus *Pancalia*. The antennae in *Bassettella* are stout, and the ciliation is microscopic, quite distinct in this respect from species of *Dasycera*. The wings of *Bassettella* are narrower

and the form of the secondaries is different, approaching that of *Butalis*. Mr. Stainton's figure (Ins. Brit., v. 3) represents the secondaries of *D. sulphurella* narrower and more pointed than are those of *D. Newmanella*, but less so than those of *Bassettella*. The ornamentation of *D. Newmanella* resembles that of most species of *Butalis*. The ornamentation of *Bassettella* rather resembles that of *Pancalia*, to which, also, I think, it makes the nearest approach structurally.

Hagno faginella seems to have the transverse dusky lines of the primaries darker and more distinct than in the Kentucky specimens, and those about the middle of the wing condensed into two indistinct fascia.

Plutella cruciferarum presents nothing unusual; but there is in the collection a single specimen which I incline to consider an undescribed species. In it the lighter color of the inner margin projects into the darker part of the wing only once, and that very faintly, behind the middle of the wing; otherwise the line between the two colors is nearly straight; the markings in the posterior portion of the costal half of the wings also differ somewhat from those of *P. cruciferarum*. But the specimen is imperfect, and I shall not at present separate it from *cruciferarum*. From an examination of my collection of *cruciferarum*, I concur with Mr. Stainton's suggestion that *P. mollipedella* Clem. is the female of *P. cruciferarum*.

The new species are as follows:

AMADRIA? Clem.

A. Clemensella. N. sp.

Yellow; the palpi are a little paler, except the outer surface of the second joint. Primaries with minute brown spots arranged in transverse rows; these require close observation: one spot on the fold and one on the end of the disc, a little larger than the others. *Al. ex.* ½ inch. There is also a row of small fuscous spots around the base of the ciliae.

TINEA.

T. obscurostrigella. N. sp.

Dark fuscous; the primaries obscurely mottled with sordid yellowish; there is a row of indistinct yellowish spots or streaks on the costa, from the middle to the tip, and along the base of the dorsal ciliae. *Al. ex.* ⅝ inch. Season, October.

ANESYCHIA.

A. multipunctella. N. sp.

Second joint of the palpi dark brown, tipped beneath with scattered white scales, and with a few scattered white scales above; third joint white, tipped beneath at the base with dark brown; face black; vertex white, with a central black spot; antennae fuscous; thorax white, with six black spots, one of which is placed close to the base of the wings and is continuous with the dark brown of the wings; two others on top, and one on each side a little before the tip. Primaries shining dark brown or black, with a wide white streak extending along the dorsal margin from the base nearly to the tip, and a white costal spot close to the tip; there is a sinus, or projection of the white into the dark brown portion, just before the middle, and from thence to the tip the line between the two colors is irregular, with another sinus behind the middle; there is a small black spot in the white at the first sinus, and six others along the dorso-apical margin at the base of the ciliae, and another in the costal white spot, or more properly, perhaps, there are three in the costal white spot, two of them being confluent with the dark brown color around it; ciliae white, except at the tip. *Al. ex.* ⅝ inch. Season, April and May. In nine specimens I detect no variation.

A. miruscella. N. sp.

Palpi pale yellowish ochreous; the second joint has two brown spots on its outer surface, that nearest to the base being largest; the third joint has the base and tip dark brown. Head pale yellowish or nearly white; antennae pale fuscous; thorax pale yellowish ochreous, with four brown spots, two of which are about the middle and one on each side near the tip. Primaries white, faintly tinged with ochreous yellow, and with a rather wide golden brown basal streak, which begins near the costa and diverges thence to the end of the cell, and from thence narrows and becomes more diffuse towards the apex, which it does not quite attain. The costal whitish portion is more streaked and suffused with ochreous than the dorsal portion, which has a small brown spot before the middle; there is likewise a row of small brown spots around the apex, at the base of the ciliae. *Al. ex.* ⅝ inch. Season, April and May.

I have not examined the neuration, and the ornamentation is unusual in the genus; but the other characters are those of *Anesychia.*

HARPALYCE, *gen. nov.*

In the neuration, and more decidedly in the form of the secondaries, this genus makes a very near approach to the *Tortricidæ*. The hind wings are as wide as in any genus of that family. The primaries, however, rather resemble those of the genus *Hagno*, and the palpi also ally it to the *Gelechidæ*.

Wings nearly horizontal (in the dead insect).

In the primaries the costa is regularly arched, and the wing is widest about the middle; the costa attains the margin behind the middle; the cell is rather narrow; the subcostal gives off four branches to the margin before the end of the cell, the first and longest of which arises before the middle, and the last of which arises close to the end of the cell, and reaches the costal margin close to the apex; the apical branch reaches the apex or the margin close to and beneath it; the discal vein gives off two branches; the median gives off, close to the end of the cell, a single branch, which becomes furcate, and the apical branch runs to the margin, parallel to the discal branches; the fold is thickened at the end, and the submedian vein is long and furcate at the base.

The secondaries are at least one-half wider than the primaries, their width being equal to about two-thirds of the length; the costa is strongly arched near the base, and *very* faintly sinuate before the apex, which is rounded, and the dorsal margin *very* faintly sinuate beneath it; the costal vein is sinuate from the margin and almost coincident with the subcostal towards the base, and attains the margin near the apex; the cell is wide; the subcostal is furcate behind the cell, with the superior branch delivered to the apex; the discal vein is curved or angulated, the angle pointing towards the base, and *near* the median it is again angulated, the angle pointing backwards, and a branch proceeds from it to the margin; the median sends a branch from behind the middle to the margin, and from the origin of the branch bends up to its union with the discal, at which it becomes furcate. Submedian and internal veins distinct. In one of the species (*canusella*) the costa is not so much arched, and the posterior margin not at all sinuate beneath the apex, and the discal vein is curved (not angulated) and unites with the median without forming a second angle, what I have described as the discal branch vein, being continuous with the median and arising from a common origin with the furcate branch.

Tongue rather short; maxillary palpi minute; labial palpi simple, *slender*, slightly overarching the vertex, the third joint about half as long as the second, and pointed; antennae simple, more than half as long as the primaries, with the basal joint short and a little enlarged; scales of the posterior portion of the vertex a little roughened, but not forming a tuft; eyes globose, of moderate size; ocelli, none.

H. tortricella. N. sp.

Yellowish or straw color; head and hind wings paler, nearly white; there is a minute, pale brownish spot at the end of the disc. *Al. ex.* ¾ inch. Season, May.

H. albella. N. sp.

White; a minute, indistinct, ochreous spot at the end of the disc, on the forewings, and a very few widely scattered dark brown scales. There is a brownish, ochreous streak on the outer surface of the second joint of the palpi. *Al. ex.* 1⅛ inch. Season, June, July and August.

H. canusella. N. sp.

Pale grayish, almost white, with obscure patches of very pale fuscous on the primaries; a small brown spot within the dorsal margin, before the middle; another a little behind it on the fold, and another at the end of the disc. At the beginning of the ciliae is an obscure, narrow, curved, pale fascia, which is very concave towards the base of the wing. *Al. ex.* ⅞ inch.

GELECHIA.

G. thoracealbella. N. sp.

Second joint of the palpi brush-like, the brush spreading and faintly divided; third joint slender, more than half as long as the second.

Palpi whitish, the second joint ochreous brown at the base, and the scales of the brush tipped with ochreous yellow; face, head, and a wide streak from the head to the apex of the thorax, white. Antennae, sides of thorax over the wings, and the primaries brown, the primaries very faintly streaked with whitish towards the apex. *Al. ex.* ⅞ inch.

G. minimaculella. N. sp.

Second joint of palpi brush-like; third more than half as long as the second.

Head and palpi ochreous yellow; palpi with the base of the second joint, a spot on its outer surface, near the tip, and a ring around the third joint, near the tip, dark brown; antennae dark brown; thorax brownish ochreous above, except the sides just above the wings, which are dark brown like the primaries, and, like them, faintly tinged in some lights with a bluish cast. Near the base of the primaries, extending from the costa to the fold, is a narrow, irregular, interrupted, somewhat oblique ochreous yellow line or series of small spots; there are three or four minute ochreous yellow spots on the disc, and a spot of the same hue about the beginning of the dorsal ciliae, and an opposite costal one. *Al. ex.* ¾ inch.

G. ochreosuffusella. N. sp.

Second joint of the palpi brush-like; third joint about half as long as the second.

Insect dark brown; second joint of the palpi above sprinkled with white or pale yellow scales; third joint ochreous or yellowish, except at the base and a narrow annulus before the middle, which are dark brown; head ochreous, densely dusted with dark brown, so as almost to obscure the ground color; thorax, base of the wings, and a streak along the fold suffused with reddish ochreous; primaries sparsely dusted with whitish and with a reddish ochreous streak at the base near the costa, as well as that on the fold, and with the costal and dorsal spots faintly indicated. The white dusting of the primaries is sometimes very distinct, and it forms an interrupted fascia or rather a line of small specks across the wing, just before the ciliae. *Al. ex.* ¾ inch.

G. depresso-strigella. N. sp.

Second joint of the palpi brush-like; third joint about half as long as the second.

Brown, with a grayish ochreous tinge, the wings streaked with ochreous and the palpi sprinkled with whitish scales. Thorax, basal portion of the wings, and a streak along the fold suffused with reddish ochreous; four very indistinct, oblique, dark brown lines extend along the disc, and the spaces between the veins in the apical part of the wing are each marked with a similar line, and all of these lines appear to be depressed or sunken below the general surface of the wing. *Al. ex.* ¾ inch. Season, July, August and September. It resembles the preceding species, but the

brush is smaller, color of the head and palpi different, and the narrow longitudinal depressed brown lines separate it from that species.

G. pallidagriseella. N. sp.

Second joint of the palpi brush-like: third joint about half as long as the second.

Palpi and head whitish, almost hoary. Pale yellowish gray, a little suffused with ochreous on the thorax and primaries. There is a minute rust red spot about the middle of the disc; extreme costa dark brown at the base; antennae dark brown. *Al. ex.* ¾ inch.

G. quadrimaculella. N. sp.

Third joint of palpi longer than the second; palpi not at all brush-like.

Dark brown, in some lights tinged with ash gray; a small dark brown spot on the fold within the basal fourth of the primaries; another also on the fold about the middle; another near it, about the middle of the disc, and another at the end of it. *Al. ex.* ⅝ inch. Season, May. The brown spots are very indistinct, differing but little from the general hue.

G. Wacoella. N. sp.

Second joint of palpi with a small brush; third about as long as the second.

Ochreous, sprinkled above with dark brown; third joint dark brown; head and thorax dark brown, with a faint ochreous tinge. Primaries dark brown; two ochreous spots on the costal margin near the base, another at the beginning of the ciliae, and two small spots of the same hue on the fold before the middle. *Al. ex.* ⅝ inch.

G. crescentifasciella. N. sp.

Palpi not brush-like: third joint about as long as second.

Ash gray, microscopically dusted with brown; there is a crescentic, very indistinct pale fascia at the beginning of the ciliae, very concave towards the base of the wing; one or two minute dark spots on the disc, and one at its apex. *Al. ex.* ½ inch. Season, April and May. It resembles *G. quadrimaculella*, but is smaller and of a more ashen hue. Sometimes the fascia is absent.

G. pullusella. N. sp.

Palpi slender, simple: third joint more than half as long as the second.

Brown, microscopically sprinkled obscurely with whitish scales. *Al. ex.* 1/6 inch. Season, August.

G. plutella. N. sp.

Palpi simple, slender; third joint more than half as long as the second, and pointed.

Face and palpi white; vertex pale yellowish, with a dusky central spot; antennae pale yellowish; patagia and costal half of the primaries, almost to the tip, creamy white; thorax and dorsal half of primaries and the tip dark brown; the whitish portion of the primaries is widest at the base, and the dark brown portion at the apex, and the whitish part sends two short, oblique projections into the brown one just before the middle and the other just behind it. *Al. ex.* ½ inch. Season, August.

The ornamentation of the wings bears considerable resemblance to that of *Plutella cruciferarum*, except that the colors are reversed.

G. sella. N. sp.

Second joint of the palpi thickened beneath towards the tip, but not at all brush-like; third joint more than half as long as the second.

Head yellowish white, sometimes with a wide longitudinal brownish streak on the vertex. Palpi very pale yellowish, with the second joint externally brown and internally streaked or sprinkled with brown, and the third joint, with the tip and a band around the middle, dark brown. Thorax and primaries pale ochreous gray; under the microscope pale ochreous yellow, somewhat dusted with fuscous. There is a velvety dark brown spot on the fold, not far from the base, behind which is usually a dark brown dorsal streak, extending more than half across the wing, perpendicular to the margin, placed before the middle, but sometimes it is represented only by a triangular spot on the fold, and which does not touch the margin; and there is another small spot of the same hue at the end of the cell, and surrounded by a paler annulus; base of the costal margin and six or seven small spots along the costa dark brown, the last of which is just before the ciliae; and there is a narrow ochreous basal streak just within the costal margin; occasionally the spots along the costa are absent. *Al. ex.* ½ inch. Season, July and September. It is a handsome species.

G. trimaculella. N. sp.

Second joint of the palpi scarcely thickened beneath; third half as long as the second; acuminate.

Head, antennae and palpi pale yellowish white; third joint of the palpi tinged with fuscous. Thorax and primaries very pale ochreous yellow (under the lens sparsely and minutely dusted with pale reddish ochreous scales); two small, nearly circular, blackish spots before the middle, one beneath the fold, the second on the disc, a little behind the first one; and a larger one of the same hue at the end of the disc, and a row of minute, dark brown spots around the base of the ciliae. *Al. ex.* ½ inch. Season, April and May.

G. elegantella. N. sp.

Second joint of palpi scarcely thickened beneath; third more than half as long as second.

Palpi white; second joint yellowish towards the tip, the third with three brown annulations, one at the base, one before the middle, and one before the tip, sometimes connected by a line along the under surface; head and thorax sordid white or yellowish, slightly iridescent; base of the primaries white, iridescent, narrow, but wider on the dorsal than on the costal margin; this is followed by an oblique, ochreous or yellowish orange band, which crosses the wing and is margined with brown before and behind, and followed by an oblique white band, which also crosses the wing, and is rather widely margined behind by an iridescent, brown line, terminating at a *smooth* tuft of raised scales on the dorsal margin, the tuft or rather smooth elevation being metallic and highly iridescent, as also are the brown margins of the ochreous bands: the dark brown, posterior margin of the second brown fascia is produced backwards along the disc and passes backwards along the disc, inclining towards, but not reaching the base of the dorsal ciliae, and containing three smooth, metallic elevations, like the one on the dorsal margin, the wing between it and the costa being white, and between it and the dorsal margin the wing is white and pale ochreous. The oblique streak terminates just before the dorsal ciliae at a curved fascia, which is very convex towards the base, is reddish ochreous on the dorsal margin, and brown on the costal margin. This curved fascia is followed by an oblique one, which is nearest to the tip on the costal margin, and the costal portion of it is wide and white, and the dorsal portion brown, and in some lights is brilliant metallic; the brown portion is narrow where it meets the white costal portion, and passes

around behind it to the costal margin, and thence curves as a narrow line backwards around the apex at the base of the ciliae, returning to its origin on the dorsal margin, thus enclosing an oblong, egg-yellow or golden patch, parallel with the base of the dorsal ciliae. In some lights this fascia is dull brown, not at all metallic, and the yellowish ochreous parts of the wing become almost brick red; and, in truth, all the colors of the wing, except the dark velvety brown streak which passes obliquely the disc, are so variable that it is very difficult to give an adequate or intelligible description of the insect. The ciliae are fuscous. *Al. ex.* ⅜ inch. Season, May, August and September. I have also received it from Miss Murtfeldt, from St. Louis.

This species belongs to the same group with *G. roseo-suffusella*, &c., and is the prettiest *Gelechia* that I have seen.

G. rufusella. N. sp.

Second joint of the palpi somewhat thickened beneath before the apex (nearly as in the European G. populella); third joint a little longer than the second.

Palpi white; second joint externally dark brown at the base. Head, thorax and base of the primaries yellowish white, with a faint reddish tinge, which gradually deepens and becomes more distinct as it passes backwards over the wings, and about the basal one-fourth becomes bright brick red, and continuing to deepen, becomes tinged with fuscous at the apex. Antennae brown, annulate with pale yellow. *Al. ex.* ½ inch. Sometimes the primaries are sparsely dusted with brown. Season, September.

G. costa-rufoella. N. sp.

Second joint of the palpi clavate, not brush-like, brown, tipped with yellowish; third joint pale yellowish. Antennae brown; head, thorax, base of the primaries, and costal margin to beyond the middle, rufous; the remainder of the primaries brown, with four small yellow spots, two of which are on the fold, and two on the disc, and a fifth small one at the beginning of the costal ciliae; ciliae brown, pale at their base. *Al. ex.* a little over ½ inch. Season, September.

G. subruberella. N. sp.

Labial palpi, with the second joint of the palpi, a little thickened before the tip, as in rufusella.

Pale ochreous, faintly tinged with rufous, streaked and blotched with brick red along the base of the dorsal ciliae; a minute rufous spot on the fold, and a circular brown one at the end of the disc, with a small one before it. *Al. ex.* ½ inch. Season, October. Very near to *rufusella*, perhaps a variety. The palpi are precisely as in that species as to form and colors, but the general hue is much paler.

G. maculimarginella. N. sp.

Second joint of the palpi a little brush-like, yellowish, dusted with dark brown; third joint dark brown, with extreme tip and a few scattered scales white; about as long as the second. Antennae dark brown; head pale ochreous yellow and brown; thorax and primaries dark gray brown, spotted with darker colors; one of the spots is on the costa near the base, and there is a small yellowish spot before it and another behind it, and beyond that is another of the dark spots; there is a dark spot on the fold, with a small yellowish one before it; a small dark spot about the centre of the disc, without any yellow spot before it, and about the end of the disc is another dark spot, with a small yellow one before it. There is a pale yellowish streak at the beginning of the costal ciliae, and an opposite dorsal one. *Al. ex.* ½ inch. Season, July.

G. argenti-albella. N. sp.

Second joint of the palpi scarcely thickened beneath; the third more than half the length of second.

Silvery white; each joint of the palpi has a dark brown annulus before the tip; there are a few blackish scales over the base of the antennae, which are annulate with brown; a small dark brown spot on the extreme costa at the base, followed by three others within the margin, and there is also a small one within the dorsal margin near the base; there is a transverse brown spot or line on the fold, and another at the end of the disc, a brownish fascia at the beginning of the ciliae, and a brownish golden streak around the apex at the base of the ciliae. *Al. ex.* $\frac{7}{16}$ inch. Season, June. A rather pretty and distinctly marked species, like *G. variiella*, but I think it is quite distinct from it.

G. bidiscomaculella. N. sp.

Pale ochreous, becoming a little deeper towards the apex of the primaries; there is a small brown spot about the middle of the disc,

another at its end, and a brown streak along the base of the costal ciliae. *Al. ex.* 3/8 inch. Season, July. I have but a single specimen, and in it the palpi are missing. Allied to *subruberella;* perhaps a variety of it.

G. subalbusella. N. sp.

Second joint of the palpi not thickened.

Creamy white, sparsely dusted with ochreous yellow and brown. *Al. ex.* 3/8 inch. Season, July.

G. parvipulvella. N. sp.

Palpi simple.

Pale yellowish white, lightly dusted with fuscous, the dusting more dense towards the apex of the primaries. *Al. ex.* 3/8 inch. Season, May and August. Possibly a variety of *G. subalbusella.*

G. lavernella. N. sp.

Second joint of the palpi a little thickened beneath towards the apex; third joint rather thick.

Palpi ochreous, with the basal half of the second joint and a band before its tip, dark brown; an annulus before the middle of the third joint, and another wide one before its tip, dark brown. Thorax and primaries gray: base of the costal margin dark brown, and from it a narrow, oblique, dark brown streak crosses the wing to the dorsal margin. in its course crossing almost at right angles an indistinct brown line which proceeds from a brown spot on the costal margin, and passes obliquely forwards nearly to the base of the wing; and at the intersection of the lines the brown color spreads around them, forming another spot; these lines are irregular, and in some parts indistinct; behind these lines the wing is densely dusted with fuscous to the tip, and a brown fascia is well indicated at the beginning of the ciliae. *Al. ex.* 1/2 inch. There is something in the clumsy looking palpi and general appearance which reminds one of a *Laverna.*

G. cilialineella. N. sp.

Only microscopically distinguishable from *G. solaniella.* Ochreous, tinged slightly with grayish; there is an indistinct brownish spot on the fold, and another a little behind it on the disc, and another in the apical part of the wing. Costal ciliae whitish, *and a narrow, indistinct, white*

line at their base, and one also at the base of the dorsal ciliæ, and three dark brown hinder marginal lines in the apical ciliæ. Al. ex. ½ inch.

G. minimella. N. sp.

Palpi simple.

Insect dark brown, indistinctly sprinkled with white. *Al. ex.* ⅜ inch. The neuration is nearly that of *Cleodora.*

ANARSIA.

A. suffusella. N. sp.

Ochreous yellow, somewhat suffused with fuscous. Outer surface of the second joint of the palpi dark brown, tipped with ochreous; third joint pale yellowish. The third joint of the palpi is more slender than in *A. pruniella* Clem., and the fascia is narrower. *Al. ex.* ¾ inch. Season April.

A. trimaculella. N. sp.

Outer surface of the second joint of the palpi dark brown, except at the apex of the tuft, where it is whitish; third joint yellowish. Head pale ochreous; head and thorax pale ochreous, densely dusted with fuscous. Primaries ochreous, suffused and dusted with brown; a small dark brown spot on the fold before the middle; one a little larger at the middle of the disc, and one at its end, and some scattered dark brown scales along the base of the dorsal ciliae, near the apex. *Al. ex.* scarcely ½ inch.

NEDA, *gen. nov.*

This genus is between *Anarsia* and *Cleodora.* It is an *Anarsia* in all but the hind wings, which are those of *Cleodora*, both in form and neuration.

Head smooth, convex; ocelli, none; antennae minutely denticulate; tongue moderate, scaled; labial palpi moderate, second joint with a projecting tuft at the apex; third joint smooth, ascending in the ♀ (all my specimens are ♀.) Primaries lanceolate, ciliae moderate; the costal vein attains the margin before the middle; the cell is narrow and pointed; the first branch of the subcostal is given off before the middle, and there are two other branches towards the end of the cell; the apical branch is

furcate on the costa before the tip, and has almost a common origin with the apical branch of the median at the end of the cell; the median has three branches behind the middle, and the submedian is furcate at the base. The secondaries are pointed, scarcely as wide as the primaries, with the dorsal margin deeply excavated beneath the tip; the costal margin is excavated from the basal third to the tip; the costal vein attains the margin about the middle; the subcostal is straight to the end of the cell, and thence bends a little upwards to the apex; the cell is very wide; the discal vein oblique, with two branches to the dorsal margin, the upper branch arising close to the subcostal, and the second continued faintly through the cell to the base; the median is trifurcate behind the middle, the first branch remote from the others; the submedian distinct; internal obsolete.

N. plutella.

Third joint of palpi and upper surface of the second one creamy white, the second otherwise dark gray brown; head, thorax and the dorsal margin of the primaries to a point beyond the beginning of the ciliae, creamy white, the primaries otherwise dark gray brown, except that the *extreme* costa is creamy white and the costal margin is obscurely streaked with the same hue. Ciliae of primaries creamy white, except at the apex. *Al. ex.* ⅝ inch. Season, September. The ornamentation reminds one of a *Plutella.*

CLEODORA.

(No species of this genus has heretofore been described from the U. S. or Canada.)

C. pallidastrigella. N. sp.

Palpi pale yellowish; a spot on top of the third joint, and the brush on the second joint reddish ochreous. Thorax and primaries pale orange; paler, nearly white, along the dorsal margin, and on the extreme costa beyond the middle; a narrow, indistinct, whitish line along the fold, ending at a small brown spot; there is an oblique, narrow, whitish streak along the base of the costal ciliae, continuous with the white of the extreme costa, and there is a short one along the base of the dorsal ciliae; a minute brownish spot surrounded by a pale ring at the end of the disc, and an oblique brownish streak in the ciliae at the apex. The brown spots are all indistinct. *Al ex.* ⅜ inch.

The neuration of the primaries differs from that of *C. cytisella*, as figured by Mr. Stainton *(Ins. Brit., v. 3)*, by having a branch from the apical vein to the costal margin, just before the vein becomes furcate, and that of the secondaries differs from it by having a single branch from the discal vein, and the subcostal furcate beyond the cell, or rather the superior branch of the discal is united with the subcostal at the cell. Nevertheless, I have no doubt that this species and the following are properly placed in this genus.

C. palliddla. N. sp.

To the naked eye this species appears very pale gray, almost white; under the lens it appears pale ochreous gray, with minute and indistinct pale fuscous specks; there is a fuscous streak along the upper surface of the second joint of the palpi, and the antennae are annulate with fuscous. *Al. ex.* $\frac{3}{8}$ inch. Season, August.

Mr. Stainton, in a foot note on page 111 of his edition of the Clemens papers, doubts whether *Anorthosia* Clem. ought to be separated from *Cleodora*. But the two genera differ decidedly in neuration, and the palpi of *Anorthosia*, as figured by Dr. Clemens, are very different from those of *Cleodora*, as figured by Mr. Stainton *(Ins. Brit., v. 3)*. On the other hand, the palpi of *Anorthosia* resemble more closely those of my genus, *Sagaritis*. In both the tuft rises above the palpal joint, instead of spreading around it, as in *Cleodora*, and in those genera the tuft is composed of long scales, whilst in *Cleodora* it is clothed with stiff, bristle-like scales. In *Anorthosia* the tuft is figured largest at the base of the joint, whilst in *Sagaritis* it is largest towards the apex. The terminal joint in Dr. Clemens' figure is represented shorter relatively to the third than it is in either *Sagaritis* or *Cleodora*. In both these genera the cell is closed in both wings, while in *Anorthosia* it is open. There are also other differences both in the form and neuration of the wings. *Sagaritis* is quite distinct from *Cleodora* in the more elongate and slender body and legs, and more graceful appearance, as well as in the form and neuration of the wings.

NOTHRIS.

N. griseella. N. sp.

Tuft large, but not projecting beyond the end of the joint, its anterior and inferior margins forming almost a right angle with each other; the

terminal joint of the palpi is nearly as long as the second, recurved; tongue rather scantily and roughly scaled at the base, the scales laterally projecting. Having but a single specimen, I have not examined the neuration, but the palpi are nearly those of *N. vecharcella*, as figured in *Ins. Brit.*, *v. 3*, than to any other genus known to me.

Pale gray; basal half of the second joint of the palpi dark brown on the outer surface; tip of third joint dark brown; basal joint and annulations of the stalk of the antennae brown. There is a rather short dark brown line on each side of the thorax above the wings. Primaries with the extreme costa at the base, and the inner angle, dark brown, and the base towards the dorsal margin suffused with faint reddish yellow; the disc from the base nearly to the middle is suffused with brown, and there are faint brownish streaks between the veins in the apical part of the wing. *Al. ex.* ¾ inch.

HOLOCERA.

H. Clemensella. N. sp.

H. chalcofrontella Clem. is so variable a species that it is possible this may be a variety of it; but it is not one of the described varieties.

Whitish, dusted lightly with dark purplish brown, the dusting dense on the second joint of the palpi. There is a purplish brown patch at the base of the costa, a small one about the middle of the costa, a small one opposite to it on the fold, a small one on the disc opposite the space between the other two, one at the end of the disc, and a row of small dots around the apex at the base of the ciliae. *Al. ex.* ½ inch. Season August.

POLYHYMNO, *gen. nov.*

The two insects for which I erect this genus are possibly not congeneric. *P. luteostrigella* is a slender, elongate insect, whilst *P. sexstrigella* is rather robust; there is but a single specimen of the latter species, and the head of that is wanting, though it is otherwise perfect. The form and neuration of the secondaries is very nearly the same in both, and so is the form of the primaries, except that those of *sexstrigella* are a little wider. The generic diagnosis is that of *luteostrigella*. The points in which *sexstrigella* differ from it are noticed under that species. The form of *luteostrigella* and the markings of the wings in both species are suggestive

of affinities with *Gracilaria*, especially the short streaks at the apex of the primaries, reminding one of the "hook" in some species of that genus. The palpi are rather suggestive of relation to *Cosmopteryx* or *Stathmopoda*, but the form and neuration of the wings place it beyond doubt in the *Gelechidæ*, though the caudate primaries are peculiar.

No maxillary palpi; labial palpi recurved, very long and slender, with the third joint longer than the second, and pointed; tongue long, scaled at the base; forehead convex; face broad; scales of the head and face appressed; basal joint of the antennae small, scarcely distinguishable from the stalk, which is long and slender.

Primaries lanceolate, narrow, caudate, the costal and dorsal margins both being excised before the tip, behind the cell, the dorsal margin deeply so, and the extreme tip is a little hooked backwards. The costal vein is short, cell narrow; the subcostal gives off two branches, both behind the middle, the first remote from the second, which is at the end of the cell; and the apical branch is furcate behind the cell, both branches going to the costal margin. The discal vein gives off a single branch, which goes to the dorsal margin, and the median is four-branched, all four at or near to the end of the cell; the submedian is furcate at the base.

The secondaries are deeply emarginate beneath the apex, which is a little hooked backwards; the subcostal gives off a long branch from before the middle, and is furcate, with one branch to the costal and the other to the dorsal margin before the tip; the cell is unclosed, and the independent discal branch arises *at* the median, which is three-branched, the first one being before the middle and remote from the others. They are about as wide as the primaries.

The neuration of the secondaries allies this genus to *Trypanisma* Clem., *Taygete*, *Evippe*, &c., Cham.

P. luteostrigella. N. sp.

Silvery white; ciliae pale stramineous: upper surface of the thorax, with four narrow, equidistant, longitudinal, golden yellow lines. Primaries with three similar golden yellow lines extending through the entire length of the wings; one of these is placed just within the dorsal margin, and is continuous with one of the central thoracic lines, but the line is very indistinct, becoming more distinct towards the apex; another of the lines on the wing is continuous with one of the lateral thoracic lines, is very

distinct, becomes furcate on the disc, one branch going to the extreme apex and the other towards the dorsal margin at the beginning of the ciliae, where it becomes confluent with the first mentioned line, but immediately separates from it again, the two lines continuing on parallel to each other around the base of the dorsal ciliae to the apex. The third line begins on the costa at the base, and runs just within the costal margin nearly to the apex, where it becomes confluent with the second or apical branch of the second or median streak. In the apical part of the wing are three golden costal streaks, which become confluent with the second and third longitudinal lines, and point obliquely backwards, the first being rather remote from the other two; behind these three streaks is a fourth one, perpendicular to the margin; behind this is a fifth, pointing obliquely forwards, and behind this again two short curved ones, pointing forwards, one at the apex and the other close to and before it. There are two distinct, though small black spots in the dorsal ciliae. *Al. ex.* 3/8 inch. Season, August.

Polyhymno? sexstrigella. N. sp.

As already stated, the head is missing in the single specimen which I possess of this species, and the primaries are wider, decidedly so in proportion to their length, being a little wider than the secondaries, and the costal margin before the tip is not so decidedly scalloped: the tip is not hooked backwards; the apical branch of the subcostal is not furcate; there are three branches before it, instead of two, as in *luteostrigella*, but the last one has almost a common origin with the apical, and the median is only three-branched, instead of four.

The secondaries are the same, except that in this species the long branch of the subcostal (the first branch) is absent.

The insect is more robust than *luteostrigella*.

Iridescent fuscous, in some lights silvery. About the middle of the primaries is an oblique, wide, silvery white costal streak, of irregular outline, reaching the fold, pointing obliquely backwards, divided in part by a narrow yellowish line, which passes back along the middle of the wing to the second costal streak, the wing above and below it being dark fuscous, somewhat iridescent; the second costal streak is white and placed behind the middle; opposite to it is a white spot, just within the dorsal margin; the second streak is dark margined behind, and the dark margin is produced backwards as a line along the centre of the apical part of the wing, but does not quite reach the apex, and nearly opposite its end are two

small, straight, silvery white costal streaks, both dark margined behind and close to each other; behind these two streaks are two others, also close together, the last one at the apex and both dark margined behind. The apical part of the wing (behind the second costal streak) is golden yellow, sprinkled towards the dorsal margin with brown. Ciliae silvery fuscous, with a wide, dark brown hinder marginal line. *Al. ex.* ⅜ inch. Season, July.

In the form and neuration of the wings, and in the disposition of the costal streaks it *approaches luteostrigella;* whether it does in the palpi and antennae remains to be seen.

Since the above remarks were written, I have received from Mr. Belfrage more perfect specimens, and find the palpi and antennae as in *luteostrigella.* It may be necessary to amend the specific description a little hereafter.

(To be Continued.)

ON A NEW SPECIES OF CERAMICA.

BY H. K. MORRISON, CAMBRIDGE, MASS.

Ceramica rubefacta (nov. sp.)

Expanse, 41 m. m.; length of body, 20 m. m.

Eyes hairy; collar and thorax reddish brown; the thorax of my only specimen was injured in capture, so that the presence, or if present, the size of the tufts could not be ascertained. But apparently it was tufted, as there are traces of a meta-thoracic elevation. Abdomen yellowish, with a strong basal tuft; the labial and anal tufts tinged with carneous; beneath red; anterior wings deep uniform red; lines obsolete; nervules distinctly black; a white dot on the costa at the base; the interior line is only represented by a white dot on the costa and on the subcostal, median and submedian nervures. The orbicular is blackish, small, oblique and with a grayish centre, situated close to the reniform, and at more than the usual distance from the base: reniform vague and blackish, with a gray

centre; the exterior line consists of faint white dots on the nervules, and its course is marked by the slightest possible change of color between the median and subterminal spaces; the ante-apical white dots are very distinct; the subterminal line wanting, except at the costa, where several linear white shades show its place. Posterior wings yellowish white, with a broad fuscous terminal border; beneath the anterior wings are gray, with traces of an exterior line; the apical, costal aud terminal regions deeply suffused with carneous. Posterior wings whitish, with the fringe yellow; the costal and apical portions of the wings carneous. *Hab.* Malden, Mass.; from my collection. Found under bark, June 24, 1873.

In a recent paper, Mr. Grote refers *Ceramica* to *Taeniocampa*, being then only acquainted with *Ceramica picta* Harr. The discovery of this species, which agrees perfectly in structural characters with *picta*, confirms my previous opinion that the genus should be recognized. The characters which separate it from *Taeniocampa* are not very striking, but they can be readily appreciated, and the habits and markings of the two species are very different from any of the *Taeniocampas*. *Rubefacta* approaches to the description of *vindemialis* Guen., but differs in the presence of the orbicular and in other particulars.

In a recent number of the ENTOMOLOGIST Mr. Grote described a species under the title of *Perigrapha normani*. In working on allied genera, we have identified this form, but we are unable to see the propriety of the generic reference.

The following are the characters of Lederer's genus *Perigrapha*:

Eyes hairy; tibiae unarmed; antennae pectinated in both sexes: collar cut out and produced in front into a sharp corner: thorax with an angular projection on each side, and bearing behind the collar a lofty, sharp-edged, longitudinal crest; abdomen with a closely cut tuft on the first segment.

In the species under consideration the antennae in both sexes are simple; the collar is not produced into a sharp corner; the thorax is rounded, without angular projections on the sides. Behind the collar there is simply a small, flat, furrowed tuft, instead of a lofty crest; the abdomen is untufted.

Such being the generic characters of *normani*, we remove it from *Perigrapha* and refer it to a separate section of *Taeniocampa*, as it agrees with the typical species of that genus, except in the possession of a slight prothoracic tuft. The known species will now stand as follows

Taeniocampa Guen.

Section 1.--Thorax untufted.
Alia Guen.
Oviduca Guen.
Pacificata Harvey.

Section 2.—Thorax with a weak, flat, furrowed tuft behind the collar.
Normani Grote.

ON THE SPECIES REFERRED TO ORTHODES BY GUENEE.

BY H. K. MORRISON, CAMBRIDGE, MASS.

In Mr. Grote's recent "List of the Noctuidæ" four of the five species described by Guenée are marked unidentified. With a very large material (nearly 100 specimens of the different species, for many of which we are indebted to Mr. F. C. Bowditch, who has found them common in the vicinity of Boston) before us, we have attempted to straighten out the species and to characterize the two genera to which we refer them.

Mr. Guenée, in instituting this genus, comprised under it many discordant forms, and in his preliminary remarks he forsees the necessity of a future generic separation of the species.

We restrict Orthodes to the group of which *infirma* is the type, and also the most widely known member.

ORTHODES Guen., Noct., vol. 1, p. 371 (1852.)

Imagines of medium size. The eyes hairy; antennæ simple in both sexes; the palpi stout, erect, thickly but evenly clothed; the terminal joint short, but distinctly separated from the other two; the collar rounded, distinctly lobed, and well separated from the thorax; in *infirma* there is an open space between the two lobes. The thorax untufted, its villosity smooth and pressed down; the abdomen untufted, in the female slightly exceeding the posterior wings; in the male long hairy tufts which have their origin at the base of the genitalia, enclose and extend far beyond the parts; the anterior wings rapidly increasing in width from the base outward, triangular, the apex and internal angle rounded. The spots and lines are very clear and evident. Beneath, the males have on the median space an irregular, slightly raised patch of closely compressed hair.

SPECIES.

Infirma, Guen., Noct., 1, p. 375 (1852).

In this species the squamation is smooth ; the lobes of the collar are separated below ; the thorax is concolorous ; the anterior wings are dull purple gray ; the lines and spots are all present, with the exception of the claviform spot, and accompanied by distinct, even, yellow lines ; the half-line parallel with the interior line ; the median lines are trapezoidal ; the median shade is blackish, diffused, and curved, passing between the spots ; the reniform and orbicular are large, contiguous, and surrounded by pale annuli ; a double row of spots on the nervules follow the exterior line ; the subterminal line is distinct, even and slightly curved ; the subterminal space dark, particularly near the costa ; a pale scolloped line at the base of the wings. Beneath yellowish, with a common line ; on the anterior wings the characteristic patch of hair is more elongated and narrower than in the allied species ; on the posterior wings discal dots.

Expanse, 32–35 m. m. *Hab.*, the Eastern and Middle States. I have also received specimens from St. Louis (Prof. C. V. Riley.)

This species is very constant, except that the ordinary spots differ in their closeness to each other. It is extremely common in the Middle States in July ; to the northward it becomes less abundant.

Cynica Guen., Noct., 1. p. 375 (1852).

Nimia Guen., id., p. 76 ; *candens* Guen, id.

♂ . . . . The collar rounded, well separated from the thorax ; there is no open space between its two lobes. It varies greatly in color from light ochreous through all the shades of reddish and purple brown. The thorax concolorous with the anterior wings ; the latter are rounded, proportionately shorter than in *infirma* ; they vary from gray, with scarcely any red admixture, to deep reddish brown. The median lines are always present, simple, black and irregular, accompanied by paler shade lines ; their position in reference to each other varies in different specimens in some they are trapezoidal, in others they are almost sub-parallel, and they vary to infinity between these two limits. The median shade is black, diffused and arcuate, always touching the base of the reniform, and approaching more or less near to the exterior line. The ordinary spots are always distinct, concolorous, with white annuli ; they vary in their distance from each other. The orbicular is usually oblique, and but little smaller than the reniform ; in

one specimen, however, it is round and very small. The subterminal line is generally whitish, distinct, and preceded by a dark shade line; this latter is sometimes absent. The posterior wings are uniform, fuscous, slightly lighter at the base, with a faint discal dot; the fringe tinged with ochreous or carneous, or with a shade between them. Beneath the anterior wings are gray, the apex sometimes carneous. The characteristic patch of hair covers the upper part of the basal and median spaces. The posterior wings are yellowish, with a discal dot and thick median line; the latter is rarely obsolete. The fringes of both wings vary; they are usually carneous, but sometimes ochreous or even pale gray. The anal tufts are usually yellowish.

Expanse, 30 to 33 m. m.

♀. In the female the collar is purple, tipped with ochreous; the thorax and anterior wings are never gray, or with any trace of ochreous, neither are they reddish brown, as in the males; they are usually of a dark intense purple brown. The median lines vary as in the males, but they are always less distinct; the ordinary spots are usually present, as in the males, but in one specimen they are barely traceable. The subterminal light line is less distinct, and frequently entirely obsolete. The posterior wings are as in the males; beneath also varying as in the other sex.

Expanse, 29 to 32 m. m. *Hab.* Maine, Mass., N. Y., Ohio; St. Louis, Mo. (Prof. C. V. Riley). Appearing in the latter part of June and first of July.

We have no hesitation in referring *nimia* as a synonym of this species, as specimens from New York exactly correspond with Guenée's description. *Candens*, however, may be distinct; but we are disposed to consider it merely a variety, from the description; at least until it is discovered and proved to be a good species.

PSEUDORTHODES *(nov. gen.)*

Closely allied to Orthodes, but we think sufficiently distinct from it. The anterior wings are narrower than in Orthodes, and lack the distinctive sexual patch of closely compressed hair of the males. The markings are confused, and the ordinary spots are obsolete. The males have not the long anal tufts found in Orthodes. The third palpal joint is longer and better defined.

Vecors Guen., Noct. 1, p. 376 (1852.)

Var. *griseocincta* Harvey, Bull. Buff. Soc. Nat. Sci, 1874.

In this species the thorax is concolorous with the anterior wings; the abdomen is smooth and flattened; the wings are usually reddish brown or gray, lustrous; the median lines are blackish and confused, often accompanied by pale, faint shade lines; the interior line is slightly oblique and sometimes geminate; the median shade is broad, black, arcuate, and diffused, touching the reniform, which is reduced to a red or white spot. The orbicular and claviform are absent. The exterior line is always simple and denticulate; the subterminal line is faint, light, preceded very frequently by a dark shade, in which are sometimes formed, opposite to the cell, black cuneiform dots. The fringe is concolorous. Posterior wings dark grayish fuscous, sometimes almost black. The discal dot is always present. Beneath the anterior wings are dark gray, with the terminal space usually light; the posterior wings lighter, with a distinct discal dot. A common median line extends over both wings.

Expanse 25 to 32 m. m. *Hab.* Atlantic States.

Nearly forty specimens were examined from different localities.

O. cynica can be justly called a variable species, but this one is infinite in its variations of size as well as color. We can not consider *griseocincta* other than a specimen in which the reddish tint is entirely absent, and the gray shades accompanying the lines are unusually prominent. The forms of this species slide so gradually into each other that it is impossible to draw distinct lines of demarcation. There are, however, two principal varieties; in one the reniform is clear, white and conspicuous, and the ground color is reddish; in the other the reniform is reddish, or indicated only by a few pale scales, and the ground color is gray with but slight reddish admixture. Specimens of this latter variety (which is the only one described by Guenée) sometimes occur in which the ground color is red, but it is more frequently the other way.

In one specimen expanding only 25 m. m., the reniform is white; the ordinary lines are diffused and black, coloring the whole wing, and entirely obscuring the usual reddish shade. In another, which approaches *griseocincta*, the expanse is 31 m. m.; the reniform is simply a few collected whitish scales. The lines are nearly obsolete, and the interior line is preceded by a faint pale shade band. The ground color is a dull lustrous slightly brownish gray.

Obituary.

The sad intelligence of the death of that distinguished Entomologist, Francis Walker, of London, England, conveyed in a brief notice in our last, will, we know, have brought grief to the hearts of all those who have been favored with the correspondence of that genial-hearted man. His continued and disinterested kindness towards all those with whom he had to do has endeared him to many. Although we never had the pleasure of a personal acquaintance with the deceased, yet to ourselves personally, as well as to our Society, he has always been among the truest and kindest friends we have had, ever ready to do us any service in his power. His death leaves a void in our circle which it will be hard to fill. The following brief sketch of his career and his unceasing labors, written by one who knew him well, will be read with interest :

It has become my painful duty to record that Francis Walker, the most voluminous and most industrious writer on Entomology this country has ever produced, expired at his residence, Elm Hall, Wanstead, on the 5th of October, 1874, sincerely lamented by all who enjoyed the pleasure and advantage of his friendship. He was the seventh son, and the tenth and youngest child, of Mr. John Walker, a gentleman of independent fortune, residing at Arno's Grove, Southgate, where the subject of this memoir was born on the 31st of July, 1809. Mr. Walker—the father—had a decided taste for science, especially Natural History ; he was a fellow of the Royal and Horticultural Societies, and vice-president of the Linnean, so that his son's almost boyish propensity for studies, in which he afterwards became so eminent, seems to have been inherited rather than acquired.

Mr. Walker's decided talent for observing noteworthy facts in Entomology was first exhibited at home, when, as a mere child, his attention was attracted by the butterflies, which, in the fruit season, came to feed on the ripe plums and apricots in his father's gardens ; *Vanessa C-Album* is especially mentioned ; and *Limenitis Sibylla*, another species no longer found in the vicinity of London, was then common at Southgate.

In 1816 Mr. Walker's parents were staying with their family at Geneva, then the centre of a literary *coterie*, in which they met, among other celebrities, Lord Byron, Madame de Stael, and the naturalists De Saussure and Vernet. They spent more than a year at Geneva and Vevey, and in 1818 proceeded to Lucerne, from which place Francis, then a boy nine

years of age, made the ascent of Mont Pilatus, in company with his elder brother Henry; their object, in addition to the ever delightful one of mountain-climbing, being the collecting of butterflies. The family afterwards visited Neuwied, and returned to Arno's Grove in 1820.

In 1830 the two brothers, Henry and Francis, again visited the Continent, and now it was purely an Entomological tour, the late Mr. Curtis, the well-known author of 'British Entomology,' being their companion. This party collected most assiduously in the island of Jersey, and afterwards at Fontainebleau, Montpellier, Lyons, Nantes, Vaucluse, &c., the French Satyridæ, of which they formed very fine collections, being their principal object.

Mr. Walker's career as an author commenced in 1832. He contributed to the first number of the 'Entomological Magazine,' the introductory chapter of his 'Monographia Chalciditum,' a work on the minute parasitic Hymenoptera—a tribe of insects which he ever afterwards studied with the most assiduous attention, and one on which he immediately became the leading authority. He was then only twenty-three years of age; but his writings exhibited a depth of research and maturity of judgment which have rarely been excelled, and which abundantly evince the time and talent he had already devoted to these insects. It is worthy of notice that he now descended from the largest and most showy to the smallest and least conspicuous of insects, doubtless feeling that whereas among the magnificent butterflies there was little opportunity for the discovery of novelties, among the Chalcidites everything was new—everything required that minute, patient, and laborious investigation in which he seemed so especially to delight. Only two authors, Dalman and Spinola, had preceded him in devoting their attention to the structure of these atoms of creation; and even these two had described comparatively a very small number of species.

In 1834 Mr, Walker, somewhat reluctantly, consented to undertake the editorial management of the 'Entomological Magazine,' and resigned this office the following year, yet continued a constant contributor to its pages. The same year he visited Lapland, in company with two of our most distinguished botanists; and in this extreme north of Europe, and especially at Alten and Hammerfest, he assiduously collected insects, more particularly the northern Diptera, the Satyridæ among Lepidoptera, and the Chalcididæ amongst Hymenoptera. During this journey we have the first and only notice of his prowess as a sportsman: he shot wild grouse

and ptarmigan; and on one solitary occasion was accessory to the death of a reindeer, but as other rifles besides his own were simultaneously discharged, it is difficult to say whose was the effective bullet. I am glad to be able to record that Mr. Walker declined to give the poor creature the *coup de grâce*, and, for this especial purpose, resigned to another his *couteau de chasse*.

In May, 1840, he married Mary Elizabeth, the eldest daughter of Mr. Ford, of Ellell Hall, near Lancaster, and spent the summer on the Continent, again collecting in Switzerland with his customary assiduity.

In 1848 he explored the Isle of Thanet, the following year the Isle of Wight, and succeeding years, 1850 and 1851, he visited Geneva and Interlachen; and during the former year commenced his great work on Diptera. This formed part of a projected series of works on British insects, to be called 'Insecta Britannica,' a project in which the late Mr. Spence took a deep interest.

During the year 1851 was published the first volume of the 'Diptera.' This work is printed in 8vo., and contained 314 pages; the second volume appeared in 1853, and contained 298 pages; and the third volume in 1856, and contained 352 pages. Thus the entire work comprised nearly 1000 pages of closely-printed descriptions.

Another tour on the Continent occupied a considerable portion of 1857, Mr. Walker visiting Calais, Rouen, Paris, Strasbourg, Baden-Baden, Heidelberg, Wiesbaden, Frankfort, Mayence, Cologne, Brussels, Aix-la-Chapelle, and Antwerp. During the journey he collected in the Black Forest; and this is the only scene of his scientific labours, during the tour, of which I have any intelligence.

The summer of 1860 was devoted to a thorough exploration of the Channel Islands. Dr. Bowerbank was his companion during a portion of the time, and, as a consequence, the sponges of these islands were a main object of research—the Gouliot caves in Sark, so celebrated for their marine productions—were a great attraction to both naturalists.

In 1861 Mr. Walker's excursions were chiefly confined to North Devon; he visited Linton, Clovelly, Ilfracombe, Bideford, and Barnstaple: and now his attention seems to have been again chiefly occupied with Lepidoptera, at the scarcity of which he was greatly disappointed, having expected, from the extensive woods, to have found moths particularly abundant.

In 1863 he toured the English lakes; and, in the spring of 1865, North Wales and Ireland; and in the autumn he again visited Paris, Geneva, Lucerne, Interlachen, and Altdorf, ascending the Righi, Mont Pilatus and the Mürren, and proceeding to Kandersteg, the Oeschinen See, and the Gemmi Pass.

In 1867 we find him again in France and Switzerland, ascending the Col de Voza, and examining the Jardin of the Mer de Glace; thence over the Tête Noir to Martigny, Sion, and the Great St. Bernard; returning by St. Maurice and the Villeneuve to Geneva.

In 1869 he made the tour of the Isle of Man, and returned by Holyhead; in 1870 he paid another visit to Llanberis, as well as to all the more beautiful scenery in North Wales, crossing over to Ireland, and touring that island from south to north; and in 1871 he examined Entomologically the Scilly Islands, and the districts of the Lizard and the Land's End.

In 1872 he turned his attention to Italy, visiting Rome, Piza, Lucca, Florence, Naples, Sorrento, Capri, Milan, and Venice, as well as the Lakes of Como and Maggiore.

And, finally, in the present year, he had again proceeded as far as Aberystwith, on his way to Ireland, when his intention was frustrated by illness, which terminated fatally on the 5th of October. He died in the most perfect peace of body and of mind. For many years Mr. Walker was a member of the Linnean and Entomological Societies of London, but resigned his membership in both some time before the close of his life.

It might be excusable in a man of such incessant bodily activity—so locomotive by inclination, so devoted to the study of Nature in all her aspects, so dilligent a collector of the objects of his favourite study—had he allowed his pen to rest while his hands were engaged in forming and arranging his collections. But this was not the case with Mr. Walker, as his Catalogues of the National Collection abundantly testify. Of the Lepidoptera Heterocera, alone, Mr. Walker catalogued and described upwards of twenty-three thousand species; in addition to which he prepared similar catalogues, although perhaps not to the same extent, of the Diptera, Orthoptera, Homoptera, Neuroptera, and part of the Hymenoptera: such an amount of labour, as is testified by these catalogues, has seldom, if ever, been accomplished by one individual. But this statement by no means represents the whole of his literary labours. He contributed

shorter or longer papers to the Transactions of learned societies, and to the periodicals of the day, especially to the 'Zoologist' and 'Entomologist;' by the indexes of the latter I find he sent thirteen communications to the first volume, three to the second, one to the fourth, thirteen to the fifth, and forty-three to the sixth; during the present year his writings appear in every number. I intended to catalogue these and his other labours, to give some idea of the number of pages, number of species and dates of each; but I can scarcely now venture to look forward to the accomplishment of this labour of love.

A word remains to be spoken of the man apart from the scientific and accomplished naturalist. Throughout my long life I have never met with anyone who possessed more correct, more diversified, or more general information, or who imparted that information to others with greater readiness and kindness; I have never met with any one more unassuming, more utterly unselfish, more uniformly kind and considerate to all with whom he came in contact. It is no ordinary happiness to have enjoyed the friendship of such a man for nearly half a century.—*Edward Newman in The Entomologist.*

CORRESPONDENCE.

ON CIRRŒDIA PAMPINA Guen.

DEAR SIR,—

In the list of the North American Noctuidæ published in the Bulletin of the Buffalo Society of Natural Sciences, we find the familiar name of *Cirrædia* Guen. replaced by *Atethmia* Hubn. We are unable to see the necessity of this change. *Atethmia* was founded by Hubner in the *Verzeichniss* (1816) on

x crampelina Hb.
ambusta W. V.
subusta Hb.

Guenée, in his "*Essai sur les Noctuèlites*," printed in the Annals of the French Entomological Society for 1839, p. 489, takes out *x crampelina*, which is congeneric with our *pampina* as well as the European *ambusta*, placing it in the genus *Cirrædia*. In 1852, the same author in the "*Species Général*," vol. 6, p. 12, defines *Athetmia* (which he spells as in the index, not the text of the "*Verzeichniss*"), referring *subusta* as the typical

species, and adding another, *inusta*, to the genus, both of these species being native in South America.

This being the synonymy of the two genera, we would retain *Cirrœdia* for our well known form. H. K. MORRISON, Cambridge, Mass.

BOOK NOTICES.

Manuscript Notes from my Journal, or Illustrations of Insects, Native and Foreign Diptera, by Townend Glover, Washington, D. C.

We sincerely thank the author of this valuable work for his great kindness in placing us on the list of the favored few among whom the first small edition of forty-five copies of the above work has been distributed. This work is unique in several respects. It is a fac simile of the author's own note book on this family of insects, written by the author himself on prepared paper, then transferred to stone and printed on a lithographic press. The costliness of the paper required for this purpose and the fact that it can only be used on one side, adds much to the expense of issuing this work, which expense has been borne entirely by the author. Such generosity and disinterestedness in the interests of our favorite science is deserving of the highest commendation.

The work is published in quarto form, and opens with three pages of introductory matter, followed by thirteen plates, containing no less than 480 excellent illustrations of Dipterous insects in their various stages, or of parts of these insects, accompanied by suitable explanatory lists of names, &c. The labor on these plates alone, all of which is the work of this pains-taking and laborious Entomologist, is something enormous, and this, to our knowledge, is but a fraction of the work he has accomplished in this department during the past few years. The next 59 pages are occupied by an alphabetical list of the families and genera of Diptera, with synonyms, habitat, food, &c. Then a list of predaceous or parasitic Diptera; vegetable and animal substances inhabited, injured or destroyed by Diptera, &c., &c. A valuable practical portion of the work is the enumeration and description of various remedies which have been suggested to guard against the injuries caused by these insects. Each division of the work throughout is arranged alphabetically and in the most convenient manner, so as to enable the student to refer readily to any portion he may desire.

Notices of other books received will appear in our next.

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